# San Mateo County Energy Strategy 2012

*Findings and Recommendations*

Prepared by the
**Utilities and Sustainability Task Force**

# ACKNOWLEDGEMENTS

We appreciate the participation, input and feedback of all the task force members and other interested parties.

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## San Mateo County Energy Strategy

San Mateo County and its cities have three critical reasons to develop and energy strategy: the ever-increasing financial costs of energy and water, the impact that creating additional energy related infrastructure will have on local communities and the increasing concern about climate change and its effects. As the State Legislature continues to develop new climate protection legislation, it is in our joint best interest to implement a strategy that puts us in control of the situation rather than being controlled by it.

The Utilities Sustainability Task Force (USTF), an ad hoc energy working group of the Congestion Management and Environmental Quality Committee (CMEQ), is composed of six elected officials and six stakeholder representatives, a project consultant, county staff and others. The USTF was chartered to consider the future energy and infrastructure needs of San Mateo County in February of 2006.

At a time when the cities and the County find themselves under pressure to adopt initiatives to protect the environment, the Energy Strategy shows that **energy efficiency and water conservation are still the most effective ways to save money, our precious resources, and the environment**.

The objective of the San Mateo County Energy Strategy is to: frame a discussion between the cities and the County about energy, water, alternative generation, and climate protection and recommend a countywide effort including goals, strategies, actions and resources.

This Executive Summary emphasizes the need for the county and the individual cities, as a whole, to act on issues related to Energy, Water, and Climate Change.

**Energy:**

**Overall, energy use is increasing.**

Pacific Gas and Electric Company (PG&E) estimates that a one percent annual increase in overall electricity use for the Peninsula area (which includes San Mateo County) is expected for each of the next five years. This extra one percent annually represents an additional 9.8 megawatts of energy that must be generated and delivered to the region every year. Meeting this demand would require approximately one small new power plant every five years. Additionally, PG&E expects the Peninsula's peak demand to grow by 11 percent in the next decade and San Francisco's peak demand to increase by 12 percent in the next decade.

**Transmission and Generation:**

**Additional transmission and generation infrastructure will impact cities and the county physically and environmentally.**

Keeping in mind that power lines to San Francisco run through San Mateo County, if both counties continue to use more energy every year as expected, the state may require PG&E to develop new power sources and to add new transmission lines through San Mateo County. Some portion of the increased demand may be offset by alternative energy systems such as solar, but the remainder will likely come from natural gas power plants, causing potential environmental impact. (Meeting peak demands generally requires the use of Peaking Power Plants, which generate higher emissions.)

**Water:**

**The demand for water is increasing.**

Water and energy use are closely related**.** A significant amount of energy is used in the county to pump, heat and treat water. Using less water, especially hot water, saves a lot of energy. This and other factors, especially the potential of drought conditions, favor water conservation.

**Costs:**

**The costs of energy and water are rising.**

The rising cost of energy, and water, to residential, commercial and industrial consumers and resulting economic implications cannot be ignored. Energy and water costs continue to increase as the need for greater infrastructure and demand increases. On the other hand, conservation and efficiency can reduce demand, and save current and future economic, social, and environmental costs.

**Climate Change:**

**There is increasing concern and awareness of climate change.**

As carbon dioxide and other greenhouse gases are released into the atmosphere from the burning of fossil fuels such as natural gas, coal and petroleum in the production of energy, the gases trap solar rays inside the earth's atmosphere and cause the temperature of the air, land and oceans to rise. Energy and water consumption are directly tied to greenhouse gas emission.

**Legislation:**

**State legislation will impact city and county governments.**

California legislation, AB32, calls for a return to 1990 greenhouse gas levels by the year 2020, which represents a 25 percent drop from today's emission rates. Longer-term, the law calls for emissions to be reduced to 80 percent below 1990 levels by 2050.

**The Strategy:**

**A county strategy that involves the cities can ensure a successful future for all residents within the county.**

The following, general outline, provides the Goals and Strategies contained in the San Mateo County Energy Strategy document. In the document, actions are divided into categories of Easy/Short-term, Intermediate/Medium-term, and Advanced/Long-term.

## Energy

**GOAL** – San Mateo County will reduce overall purchase of energy from utilities and develop clean, renewable energy within the region.

**STRATEGY** - Make energy efficiency standard practice.

**ACTIONS:**

- Partner with an Energy Service Company to assess energy-saving opportunities with the latest energy-efficient technologies in government facilities.

- Assign staff, a climate action coordinator, hire consultants, or get volunteers to create the inventory and develop a plan to save energy and water.

- Establish an energy-efficiency implementation action plan including updating General and Strategic Plans and the creation of an Energy Element.

**STRATEGY** - Promote cleaner and greener sources of energy.

**ACTIONS:**

- Install solar electric panels, solar hot water systems, develop cogeneration and alternative fuels at city facilities.
- Encourage investment in clean energy systems such as solar electric and solar hot water by providing rebates and reducing or eliminating permit fees.
- Adopt green building standards and ordinances.

## Water

**GOAL** - Reduce community-wide water use by 10 percent below projected 2020 potable water use levels and by 15 percent below projected 2030 potable water use levels, so that water purchases from the Hetch Hetchy regional water system stay within the Supply Assurances for San Mateo County.

**STRATEGY** – Make water conservation and reuse standard practice.

**ACTIONS:**

- Ensure city facilities and businesses use drought-tolerant plants and appropriate water conserving irrigation (drip irrigation or "Smart Controllers) and high efficiency toilets.
- Develop a recycled water system for city facilities and adopt tougher water conservation ordinances including a water-conserving rate structure and increase public awareness of the value of water and the importance of water conservation and landscape water use efficiency.
- Offer financial incentives and rebates to offset the purchase price of water conserving products such as high-efficiency washing machines and low flow water fixtures.
- Update General, (land use, circulation, housing, conservation, open space, noise and safety), and municipal codes to water conservation policies and support the new state-mandated landscape guidelines.

## Collaboration

GOAL **- Establish an effective, interactive relationship with utilities for long-term planning and communications.**

STRATEGY - Collaborate with public utilities for mutual benefit.

**ACTIONS:**

- Review quarterly updates from PG&E about future utility projects and take action as required.
- Support passage of net-metering legislation to allow cities to "sell" their excess self-generated energy to the utility and apply the credits to other government accounts.

**STRATEGY** - Collaborate with other jurisdictions to save time and resources.

**ACTIONS:**

- Collaborate with other jurisdictions that have similar results from their baseline inventories.

# Economic Opportunities

## GOAL - Strengthen the long-term economic health of the County, supporting the clean technology sector.

**STRATEGY** – Encourage clean technology businesses to locate in the County.

**ACTIONS:**

- Invite venture capitalists to speak at local forums to educate the broader community about the importance of the clean and green technology sectors.

- When in the market for alternative energy or energy-saving products, buy from local companies and take advantage of technical evaluations and group discounts.

**STRATEGY** – Help accelerate the adoption of clean technologies, both locally and globally.

**ACTIONS:**

- Recognize or feature local green business at City Council meetings or other public venues.
- Discount/rebate on the business license fee if achieve Green Business Certification.
- Competition among different retail districts or office parks to see how many businesses can become certified as a Green Business. Urge consumers to patronize local green businesses.

## Shared Leadership

**GOAL** – To achieve the goals of the Energy Strategy, encourage environmental leadership in all government departments, the business community and residents.

**STRATEGY** - Invest in environmental expertise in local government.

**ACTIONS:**

- Identify and train a point person for environmental issues on City Council and on staff and take advantage of free or low-cost training opportunities offered by Energy Watch, the Pacific Energy Center, RecycleWorks, Build It Green and other organizations.
- Share a single resource among several cities with a similar energy profile and establish an Energy Task Force to identify, analyze, plan, prioritize and implement energy-saving measures in civic facilities and the broader community.

**STRATEGY** – Recruit and support community leaders at every level.

**ACTIONS**:

- Partner with businesses, local Chamber of Commerce, nonprofits, schools and other groups to influence resource-efficient behavior in all parts of the community.
- Leverage and support state and regional public outreach and education programs.
- Post energy efficiency information and materials available thru all venues and encourage a competition between neighborhoods for the most innovative energy and water saving ideas.

**Next Steps:**

The City/County Association of Governments (C/CAG) proposes the following next steps to move this important project forward:

- C/CAG will provide presentations to the cities, asking that they adopt this document, commit to working with the other cities in the County, and release energy use information to support these goals.
- C/CAG will work with county staff to fund a position to support the cities in this effort.
- C/CAG will schedule quarterly, relevant educational presentations, bi-monthly information sharing meetings, and an annual progress report to the C/CAG board of directors.
- C/CAG will provide incentives to promote the completion of a government operation inventories for all cities in the County by the end of March 2009.

**Conclusion:**

**After studying energy supply and demand trends, the generation and transmission systems in the state and county, the relationship between water and energy, environmental, social, and economic costs, the San Mateo County Energy Strategy recommends immediate action to promote energy efficiency and water conservation measures. Additional efforts should be made to create new sources of alternative energy generation and to find new water sources including recycled water. Working collaboratively, we can do a lot to reduce costs, save our resources and the environment.**

## NOTE TO READERS:

Terms that are underlined and in bold type are defined in the Glossary, Appendix B. Much of the information presented in *Section 3: Findings*, is detailed in the staff reports reproduced in Appendix C. Additional information supporting the recommended actions in Section 6 can be found in Appendix D, Resources.

Each section of this document builds on the prior material, so the document will be most valuable if read from start to finish. However, each section can stand on its own if needed.

# SECTION 1. BACKGROUND

In 2005, San Mateo County Board of Supervisors President Jerry Hill proposed the need for a countywide task force to investigate and recommend how best to meet the county's current and future energy needs.

In February 2006, the Congestion Management and Air Quality Committee[1] authorized the creation of an ad hoc energy working group to develop an energy strategy for San Mateo County. The group was chartered to consider the future energy needs of the county and recommend how to address the needs in an environmentally, socially and fiscally responsible manner. This resulting Energy Strategy focuses primarily on electricity use, but also covers natural gas use and water consumption as it relates to energy use. Forms of energy used for transportation are not in the scope of this report or the recommendations.

The working group was composed of six elected officials and six stakeholder representatives, and first met in June 2006. The group chose the name Utilities and Sustainability Task Force (USTF) in case it was later asked to address other utility or environmental issues after completing its initial work on the Energy Strategy.

The task force started by defining the desired outcomes and guiding principles for the Energy Strategy.

## Desired Outcomes

- Energy is consistently available and affordable for all residential, commercial and industrial users in San Mateo County.
- Energy will be consistently available and affordable for future generations of San Mateo County residents and businesses.
- The environmental impact of energy production is minimized to the greatest extent possible.
- Local officials are involved in Pacific Gas & Electric's (PG&E's) planning process regarding local production, transmission and distribution of energy, for both centralized and **distributed generation**.
- Policy makers and the public understand the impact of their actions, make wise energy choices and utilize existing and future energy efficiency programs.
- The linkage between water and energy use is understood and recognized.
- San Mateo County is a leader in providing solutions for **energy efficiency** and **greenhouse gas** reduction.

## Guiding Principles

- San Mateo County communities will, to the greatest extent feasible, establish standards that are consistent within the county and across the Bay Area, and share programs and educational materials. Applicable actions from the California Energy Action Plan II[2] will be included in the Energy Strategy.

[1] CMAQ changed its name to the Congestion Management and Environmental Quality Committee (CMEQ).

[2] The California Energy Action Plan was first published in 2003 and updated in 2005 (Energy Action Plan II). It is discussed in Section 2, Context.

- The Energy Strategy will leverage all existing and future federal, state, regional and public purpose (such as PG&E-administered) programs to the greatest extent feasible.
- Government agencies should lead by example in reducing energy and water use, enforcing regulations and educating citizens about energy issues.
- The City/County of San Francisco's energy use is inseparably linked to San Mateo County's use, so future strategies must be collaborative and consider the needs of both Counties.
- The process for developing the plan and recommendations is transparent and open.
- Quick and visible wins are important for building credibility and commitment. If solutions that are easy to implement are identified during the process, these can be recommended to CMEQ prior to the full report.
- Policies and programs should be designed to meet long-term goals.
- In accordance with the California Energy Action Plan II, conservation, efficiency, and demand management are the preferred ways to reduce energy use. Should new generation or infrastructure be required, it will be done with the least possible environmental impact.
- Energy solutions should support economic development and offer new job opportunities.
- Future land-use planning and development should include responsible energy decisions.
- Public education and awareness programs should promote responsible energy and other resource use by the public.
- Recommendations will take into account **environmental justice** impacts.
- Decisions will not increase greenhouse gases and will preferably contribute towards significant reductions.

## Data-Gathering

The task force educated itself on a range of relevant topics, including historical and current energy use, energy forecasting methodology, the impact of peak power on infrastructure needs and the state's complex energy regulatory framework. The task force also learned about the relationship between energy and water and between energy and climate change. (Some of the key staff reports are reproduced in Appendix C.)

After reviewing the data, task force members realized that **if the historical trend continues, the county will use 22 percent more energy in 2027 than it does today**.[3] Further, if San Mateo County's cities and water agencies fail to meet their current water conservation plans, total water demand in 2027 could be nearly 5 million gallons higher per day. Such significant growth in energy and water demands would require more energy infrastructure (e.g. power plants and transmission lines), consume a larger percentage of public and private budgets, and emit more greenhouse gas emissions.

*Countywide energy and water goals are necessary to maintain the county's economy and quality of life.*

The group invited speakers to present information about the programs and resources offered to local governments to help

[3] This number is derived from the five-year projections developed by PG&E, described in Section 3, Findings.

them save energy and water. Reports on actions taken by other Bay Area cities were also provided.

The task force concluded that countywide energy and water goals are appropriate and necessary to maintain the county's economy and quality of life. The task force members also developed supporting goals to encourage economic development in the clean technology arena, increase collaboration between local governments and with public utilities, and promote environmental leadership in multiple sectors.

## Report and Next Steps

Based on input from elected officials and staff from several jurisdictions, this Energy Strategy Report includes the following elements:

- Countywide goals and strategies
- Best management practices for energy efficiency and water conservation
- References to successful measures taken by neighboring governments
- Comprehensive list of resources

The task force now requests that CMEQ, City/County Association of Governments (C/CAG) and all 21 jurisdictions in the county do the following:

- Pass a resolution accepting the findings, goals and strategies in this Energy Strategy Report
- Participate in the development of the countywide Energy Strategy Implementation Plan
- Begin taking action in their own government facilities and in their communities

USTF members and staff believe this Energy Strategy will be useful to elected officials and staff in the cities and the County, the business community, residents and other parties interested in energy issues. Input and additional information are welcomed. Please send comments to the County of San Mateo Resource Conservation Programs Manager, Kim.Springer@co.sanmateo.ca.us, (650) 599-1412.

# SECTION 2. CONTEXT

## Role of Energy

Energy is the lifeblood of the modern age. As long as the lights are on and a hot shower available, most people don't worry about how energy is produced and delivered to their homes or businesses. Very few consider the impact of their actions on the energy supply, the economy, society or the environment.

Only when an outage occurs is it clear how much of one's daily existence depends on the electric grid and natural gas supply. The energy crisis of 2000-2001 demonstrated how vulnerable local governments, businesses and individuals are to energy price increases and supply disruptions.

In San Mateo County, the rotating block outages in 2001 caused billions of dollars of productivity losses.[4] Soaring energy prices hit low-income families particularly hard and severely affected both small and large businesses. The experience serves as a reminder that **an affordable, reliable energy supply is vital to the continued quality of life and economic health of San Mateo County**.

An almost invisible cost of a reliable energy supply is the environmental impact of energy production and transmission facilities. San Mateo County has never had a power plant within its borders. That will change when a new power plant opens at San Francisco International Airport.[5] Although the new plant will use a natural gas turbine technology—the cleanest available for a fossil fuel plant—it will generate particulate pollution and greenhouse gases. It is expected to run 50 percent of the time.

The energy delivery infrastructure has a smaller impact on its surroundings than a power plant, but is still worth noting. Transmission lines carry high voltage electricity from power plants to substations. The lines interrupt open space and residential neighborhoods and disturb wildlife habitat. Substations use transformers to convert the high voltage into lower levels that can be sent across smaller distribution lines. Power lines are usually (but not always) situated away from residential areas, surrounded by fences and posted with warning signs. These, too, are unsightly.

**Because a single electric grid serves the entire region, the actions of one group affect everyone else.** In San Mateo County, the average household in each of the four most affluent communities consumes between two and five times more energy than households in other cities. Although residents in those communities pay higher utility bills, their energy habits require a larger energy infrastructure in the county than would otherwise be needed.

## Regulatory Framework

Three agencies oversee and regulate California's energy system, with separate and interlocking duties. They are the:

- **California Independent System Operator** (CAISO) - operates and manages the overall transmission system, also known as the grid

[4] The biosciences, manufacturing and information technology industries are particularly vulnerable to power outages, often losing days or months of work. *The Bay Area – A Knowledge Economy Needs Power* (Bay Area Economic Forum, 2001), http://www.bayeconfor.org/pdf/PowerBAEF.pdf, p. 36-37.

[5] The 49 megawatt facility is planned, but work has not begun and no opening date has been set.

- **California Public Utilities Commission** (CPUC) - regulates the local distribution system and approves rates

- **California Energy Commission** (CEC) - tracks historical use, forecasts future needs, sets energy efficiency standards, develops new technologies and provides rebates for renewable energy

The Governor appoints the board members for all three agencies. The Legislature enacts energy legislation which must be approved by the Governor.

PG&E is an Investor-Owned Utility (IOU) that owns and manages the transmission system in its Northern California territory and delivers electricity to end users. It forecasts the future energy needs for its territory and administers Public Goods Funds (collected from rate-paying customers) for public purpose programs. PG&E also owns and manages a natural gas distribution network and delivers natural gas to end users.

Some cities buy and deliver electricity and natural gas to their residents and local businesses. Palo Alto and Sacramento are both Municipal-Owned Utilities (MOUs). MOUs pay a fee to their local IOU to use the local transmission and distribution infrastructure. They set their own rates; fees usually go into the general fund. There are currently no MOUs in San Mateo County.

## Policy

Following the 2001 energy crisis, the regulatory agencies, the California Independent System Operator (CAISO), the California Energy Commission (CEC), and the California Public Utilities Commission (CPUC), developed an Energy Action Plan (EAP). Its goal was to ensure adequate, reliable and reasonably priced electricity and natural gas supplies through cost-effective and environmentally sound policies, strategies and actions. The EAP established a "loading order" to prioritize how the state should meet its increasing energy needs.[6] The loading order calls for reliance on:

- **Energy efficiency**: using the minimum amount of energy necessary to effectively perform a task; for example, using a compact fluorescent light instead of an incandescent bulb to light a room

- **Demand response**: discounted rates that encourage users to lower their energy use when demand is high, and thereby prevent power outages

- **Renewable energy:** capturing energy and producing electricity from natural and renewable sources through the means of solar panels, wind turbines, hydroelectric dams, etc.

- **Distributed generation (DG)**: decentralized, renewable energy sources that supplement energy produced at centralized power plants

- **Clean fossil fuel**: highly efficient natural gas facilities instead of coal-fired plants

## Impact

California's strong regulatory framework and focus on energy efficiency have kept the state's per-capita energy use relatively flat over the past 30 years, compared to an

*California's per-capita energy use has remained relatively flat over the past 30 years, compared to an average 45 percent increase elsewhere.*

[6] The loading order was affirmed in the 2005 update to the plan, and specific state actions were outlined according to this ranking. http://www.energy.ca.gov/energy_action_plan/2005-09-21_EAP2_FINAL.PDF.

average 45 percent increase in other states in the same period.

The state's programs and policies (such as Title 24, requiring new and renovated buildings to be energy efficient) have been widely copied throughout the country. Appendix D provides information on several of the policies, technologies, programs and financial incentives available to local governments, businesses and consumers that have helped keep use levels stable.

# SECTION 3. FINDINGS

The Energy Strategy was developed after extensive data-gathering and analysis. Sources included the Associated Bay Area Governments (ABAG) Energy Watch Partnership, the Bay Area Water Supply and Conservation Agency (BAWSCA), PG&E, state agencies, other Bay Area cities, local experts and innumerable web sites. Other regional energy plans, climate protection plans and handbooks were used to identify best management practices.

Highlights of the task force's findings are provided here to give context to the Energy Strategy's recommended goals, strategies and actions. A few key staff reports are reproduced in Appendix C; the full set of reports and presentations are available on the USTF website, http://www.ccag.ca.gov/ustf.html.

## Energy Demand

PG&E is responsible for forecasting future energy needs in its territory based on historical demand, anticipated population increases, expected job growth and numerous other factors. The forecasts are used to ensure that sufficient electricity and transmission capacity are available to meet expected demand and prevent outages.

**PG&E estimates a one percent annual increase in overall electricity use for the Peninsula area** (which includes San Mateo County) **over the next five years**.[7] It may not sound like much, but an extra one percent represents an additional 9.8 **megawatts** of energy that must be generated or delivered to the region every year. Meeting such increased demand will require approximately one small new power plant every five years.

**Peak demand** is the biggest factor in planning how much energy infrastructure is needed in a given area. Demand for energy in the Bay Area generally peaks on weekday summer afternoons when most businesses use air conditioning. Power plants that are used only when needed to meet the increased demand are called peaker plants.

PG&E expects the Peninsula's peak demand to grow by 11 percent in the next decade. San Francisco also relies on transmission lines in San Mateo County; its peak demand is expected to increase by 12 percent.

**If both counties continue to use more energy every year as expected, the state will require PG&E to develop new power sources and add new transmission lines to prevent outages.** Some portion of the increased demand may be offset by new solar electric and other renewable energy systems, but the remainder will likely come from natural gas power plants and their environmental impact will be significant. Even the cleanest fossil fuel plants emit greenhouse gases and air pollution.

**Using more energy will also lead to higher energy bills**. As energy prices continue to rise, the financial impact of energy use will be magnified. San Mateo County residents, businesses and governments may find themselves spending a very large portion of their budgets on utilities if PG&E's energy projections prove accurate and demand is not curbed.

## Energy Supply

### SOURCES

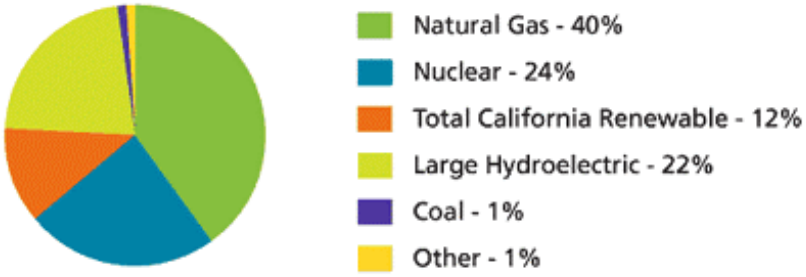
#### *Centralized Production*

[7] PG&E does not publish its projections beyond a five-year period.

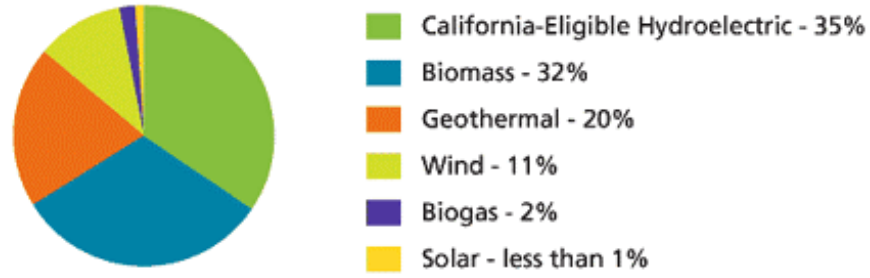
PG&E supplies electricity and natural gas to all of San Mateo County. The investor-owned utility owns 80 power plants and buys power from 400 other plants. Its energy mix is the cleanest in the country, with more than half of its energy derived from non-fossil fuel sources and 12 percent from California renewable resources (2006 data).

The state's Renewable Portfolio Standard requires utilities to obtain 20 percent of their energy portfolio from renewable sources by 2010.[8] Eligible renewable resources include **geothermal**, most **hydroelectric**, **biomass**, selected municipal solid waste facilities, **solar** and **wind**.[9]

**PG&E's 2006 Electric Power Mix Delivered to Retail Customers**




**PG&E's 2006 California-Eligible Renewable Resources**




As defined in Senate Bill 1078, which created California's renewable portfolio standard, an eligible renewable resource includes: geothermal facilities, hydroelectric facilities with a capacity rating of 30 MW or less, biomass, selected municipal solid waste facilities, solar facilities, and wind facilities.

Source: http://www.pge.com/education_training/about_energy/how_electric_system_works/2006_energy_mix.html.

## *Self-Generation*

More than 13,000 customers in PG&E's territory now meet some or all of their energy needs through **self-generation**, where they buy or lease systems that produce energy on-site. Several kinds of self-generation systems are eligible for rebates, tax credits or other financial incentives that make them more affordable to install. Self-generation systems are usually more cost-effective for users in the long-term. Depending on the financing model, they often provide near-term savings as well.

Self-generation systems also help the overall electric system by reducing the load on the grid and contributing energy when it is needed most, during peak periods. **Solar electric** systems frequently produce more energy in

[8] PG&E has announced it will not meet this goal initially, but will exceed requirements in 2011 and following years.

[9] http://www.energy.ca.gov/2007publications/CEC-300-2007-003/CEC-300-2007-003-CMF.PDF, p. 1.

summer afternoons than the owner can use. As long as the system is connected to the grid ("grid-tied"), the extra energy can flow onto the grid and be used elsewhere.

"**Net-metering**" describes a user's ability to store energy credits with the utility for later use. State legislation currently limits net-metering to a single account, meaning any energy credits produced at a site can only be used at the same site or meter. Some municipalities, including Davis and San Francisco, have successfully lobbied for legislation allowing them to apply energy credits earned at one site to their accounts at other facilities. The Utilities and Sustainability Task Force is collaborating with PG&E to support legislation that would allow jurisdictions in San Mateo County and throughout the state to become eligible for similar treatment.

San Francisco, Marin and Oakland-Emeryville-Berkeley are investigating **Community Choice Aggregation (CCA)**, under which a government entity buys energy and resells it to residents and businesses in its own community. The agency pays a fee to PG&E for the use of its distribution infrastructure. Governments hope to use CCA as a mechanism to buy a preferred type of power (usually green or renewable) at a lower cost than is available through PG&E. Critics suggest that the promised benefits of CCA are difficult to secure.

### DISTRIBUTION

PG&E owns the energy infrastructure within its territory, consisting of:

- **High-voltage transmission lines** that connect power plants to substations and form the backbone of the electric grid;
- **Substations** that connect the transmission and distribution systems. High voltage power enters and is "stepped down" to lower levels for distribution over lower-voltage lines;
- **Primary and secondary distribution lines** that carry power from the substation out to customer areas;
- **Transformers** that lower voltage down to usage levels;
- **Switching equipment** that lets the lines be connected in multiple combinations to reach a particular destination, and
- **Service lines** that deliver power to residential, commercial and industrial customers.

## Energy and Climate Change

When fossil fuels such as natural gas, coal and petroleum are burned to produce energy, carbon dioxide and other greenhouse gases are released into the atmosphere. The gases trap solar rays inside the earth's atmosphere, causing the temperature of the air, land and oceans to rise.[10] The slow but steady increase in the earth's temperature is referred to as **global warming**.[11]

[10] For a more detailed explanation of the impact of greenhouse gases on climate, see the Union of Concerned Scientists website, http://www.ucsusa.org/global_warming/science/emissions-of-heattrapping-gases-and-aerosols.html.

[11] The term "**climate change**" is used to indicate the impact of increased global temperatures on both short-term and long-term climate patterns across the world. The term "**climate protection**" describes measures taken to reduce the impact of human activity on global temperatures and the climate.

Public utilities today mostly burn fossil fuels—especially coal—at their power plants to generate the electricity distributed via the grid. The utilities also deliver natural gas directly to homes and business, where it is burned by the consumer. Natural gas is the cleanest fossil fuel, yet its principal component is methane, a greenhouse gas 23 more damaging to the atmosphere than carbon dioxide. **All energy produced or delivered by utilities generates greenhouse gas emissions.**[12] In contrast, energy produced by solar electric, solar hot water, wind and other non-fossil fuel systems generates little or no greenhouse gas emissions. **Using less energy from utilities will reduce greenhouse gas emissions.**

In fall 2006, the Governor and California legislature passed landmark legislation mandating significant reductions in greenhouse gas emissions from "stationary sources" such as power plants and petroleum refineries. Even though AB32, the Global Warming Solutions Act, starts by targeting specific industries**, local governments will soon be required to play an important role in helping the state meet its greenhouse gas reduction goals.** AB32 calls for a return to 1990 greenhouse gas levels by the year 2020, which represents a 25 percent drop from today's emission rates. Longer-term, the law calls for emissions to be reduced to 80 percent below 1990 levels by 2050.

*The simplest, fastest and most cost-effective way to reduce greenhouse gas emissions is to use less energy and cleaner energy.*

**The simplest, fastest and most cost-effective way to reduce harmful greenhouse gas emissions is to use less energy overall and to use cleaner forms of energy.** Decreasing the level of energy use throughout the county is a critical first step in reducing greenhouse gases and slowing the impact of climate change, as directed by the state.[13]

## Energy and Water

A surprisingly large amount of energy is needed to supply clean water to homes and businesses and to treat water after its initial use.[14] Almost one-fifth of all electricity and one-third of all natural gas consumed in the state is consumed in the water lifecycle, for conveyance, treatment, distribution, end use and wastewater treatment.

Somewhat lower levels of energy are needed to supply San Mateo County with water, since 96 percent comes from the Hetch Hetchy regional water system.[15] Owned and operated by the San Francisco Public Utilities Commission (SFPUC), the Hetch Hetchy system relies on gravity to carry snowmelt from the Sierra Nevada mountain range to the Bay Area, so very little energy is used for conveyance. The water is also remarkably pure, so only minimal energy is needed for filtration and treatment. The energy used in the distribution, end use, wastewater treatment and recycling phases is comparable to that of other regions in the state, however.

**The majority of energy is consumed at the end-use phase of the water supply lifecycle.** Indoor end use (68 percent of the water consumption in San Mateo County) includes toilets, sinks, showers, laundry, cooking, cleaning and commercial activities. Outdoor use (32 percent) includes landscaping, pools and recreation fields. **Most end-use energy is used to heat water.** In homes and businesses alike, hot water is mostly used indoors

[12] In Northern California, PG&E's relatively clean power mix produces fewer greenhouse gases than energy derived from more traditional sources.

[13] For more information on the state's extensive climate change activities, visit the California Climate Change Portal at http://www.climatechange.ca.gov/index.html.

[14] For more on this topic, see "California's Water-Energy Relationship," http://www.energy.ca.gov/2005publications/CEC-700-2005-011/CEC-700-2005-011-SF.PDF and "Energy Down the Drain: the Hidden Costs of California's Water Supply," http://pacinst.org/reports/energy_and_water/energy_down_the_drain.pdf (NRDC, 2004).

[15] The remainder of the San Mateo County water supply is 1.5 percent groundwater. 2.1 percent surface water and .4 percent recycled water, according to numbers provided by BAWSCA.

for dishwashers, clothes washers and showers. Commercial cooling towers, pumps and purification systems are the biggest users of non-heated water in addition to toilets and outdoor applications. Leaks can add up to 10 percent of total consumption.

For virtually every end use, a high-efficiency technology and/or water-conserving practice exists that can dramatically reduce water consumption. **Because of the high correlation between water and energy, water conservation measures provide multiple benefits: they save water, which thus saves energy, and thus reduce greenhouse gas emissions.**

Demand for water, like energy, peaks in the summer months when landscaping, cooling and other seasonal uses increase. Reducing peak water demand in the summer will provide the additional benefit of reducing the strain on the electric grid during critical times. If demand is lowered on a consistent (i.e. non-emergency) basis, it will help reduce the need for new energy infrastructure in the region.

*Water conservation measures provide multiple benefits: they save water, save energy and reduce greenhouse gas emissions.*

Using renewable energy instead of energy from the electric grid to heat water can help to mitigate the downstream impact of water use on global warming. **Solar hot water**, **fuel cell** and **co-generation** systems can all be used to heat water for residential and commercial use, although they do not provide the benefits that come from water conservation.

**In addition to saving energy, water conservation mitigates the risk of supply shortages and rate hikes.** Less than one percent of the earth's water supplies are suitable for human consumption and reserves are disappearing fast. San Mateo County is critically dependent on the Hetch Hetchy regional water system and is thus vulnerable to water shortages that can result from even a single dry winter. Increasing demands on the system also pose a risk to users; since 1971, when the last major supply improvements were added to the system, the number of people served by the Hetch Hetchy system has increased by more than 28 percent. The service population is expected to increase an additional 12 percent by 2030.

The Hetchy Hetchy system owner, the SFPUC, has entered into long-term contracts with its water agency customers to guarantee the amount of water to be provided to each and at what rate. These "assurances," as they are called, account for projected growth in demand and assume that each water supplier will implement "cost-effective and feasible" measures to conserve and recycle water and develop other local water supplies (such as groundwater and surface water capture). To meet its 2030 (?) assurances, the SFPUC proposed to increase by 25 million gallons per day the amount of water drawn from the Tuolumne River (which has been designated a "wild and scenic" river by the ____). Environmental groups oppose the SFPUC plan, calling for more accurate projections and a greater reliance on water conservation, recycling and reuse measures.

BAWSCA has proposed that the region's 2030 water needs should be met through a combination of measures that require no additional diversions from the Tuolumne River. Relationship to the Tuolumne River? The measures would include partnering with other users of Hetch Hetchy water to fund conservation activities outside the Bay Area, in addition to conservation, recycling and the development of other local water sources. San Mateo County communities will be required?/ encouraged? to implement such measures to stay within the assurances?? /prevent additional diversions from the Tuolumne??.

Another factor may affect the future water supply: global warming. Just as water use indirectly contributes to global warming through the intensive use of energy for its conveyance, treatment, etc., global warming will affect water supplies everywhere in the world. In the Bay Area, the effect will likely be felt in four ways:

- Sea level rise in San Francisco Bay will cause saltwater intrusions into groundwater supplies and the levee system in the Delta, endangering fish and other marine life. Increasing sea levels will also cause coastal and bayside flooding, submerging wastewater treatment plants and other water and sewer infrastructure.

- The Sierra Nevada snowpack will shrink as air temperatures rise and melt earlier in the year. Spring runoff patterns will change in timing and intensity.

- Less snow and more rain will fall in the Sierra Nevada and Bay Area. The rainy season may be shorter and more intense, which could lead to flooding, levee failures and sewer and wastewater treatment plant spills.

- Droughts will be more frequent, resulting in water shortages.[16]

Implementing water conservation practices and high-efficiency technologies now will help San Mateo County communities prepare for expected changes in the water supply.

Finally, water conservation will mitigate the financial impact of scheduled rate hikes. The water rates charged by San Francisco to its wholesale water agencies will triple in the next several years, increasing from $531 an acre-foot in 2007 to a projected $1577 an acre-foot in 2015. These increased costs will be passed along to water customers.

## Clean Energy

When most people think of clean energy, they think of **solar electric** panels. Northern California leads the country in solar adoption, with an astonishing 44 percent of all U.S. customer-owned solar electric systems.

Several factors contribute to the increased popularity of solar electric systems in the region:

- The state's Million Solar Roofs dedicates $2.9 billion for solar electric rebates over 10 years, with a goal of financing 3000 megawatts of capacity by 2017.[17] Government, residential and commercial customers are all eligible for rebates.

- Higher energy prices, uncertainty about future energy costs and better financing options make the high upfront cost of solar electric systems less of a barrier than in years past.

- Venture capital investments in the clean technology industry have exploded in the past two years, creating dozens of new solar companies in the Bay Area alone.

- Technology improvements have increased the efficiency of solar photovoltaic (PV) cells, so fewer panels can generate the same amount of electricity at lower cost.

- New products have overcome traditional barriers, such as solar-integrated roof shingles that are less obtrusive than traditional PVs. New thin film technologies can be used in the tight spaces and odd angles of complex rooflines.

- Public and private sector installations are growing increasingly common and larger in scope. Solar is becoming a mainstream investment.

Several cities in San Mateo County have installed or plan to install solar electric systems to government facilities. Almost all jurisdictions in the county have lowered solar permit fees in recent years.[18] Residents in

[16] "From Watts to Water: Climate Change Response through Saving Water, Saving Energy, and Reducing Air Pollution," p. 9 (Santa Clara Valley Water District, 2007). For more on this topic, see the study by the Union of Concerned Scientists, "Our Changing Climate: Assessing the Risks to California," pp 6-7, at http://www.energy.ca.gov/2006publications/CEC-500-2006-077/CEC-500-2006-077.PDF.

[17] The website is http://www.gosolarcalifornia.ca.gov/.

[18] Solar permit fees for each jurisdiction are listed in Appendix A.

several cities in the county (e.g. Portola Valley, Woodside, Menlo Park, Atherton and San Carlos) have banded together to purchase solar electric systems as a group.

Solar hot water systems use sunlight to heat water and can save up to 75 percent of water-heating energy costs. Efforts are underway in the legislature to create a 10-year, $250 million program to install 200,000 solar hot water systems by 2017. Such a program would be similar, though much smaller in scope, than the Million Solar Roofs initiative.

Other types of clean energy are also gaining traction. The County of San Mateo installed a **co-generation** system at the Maguire Detention Center, using natural gas to produce both heat and electricity. Millbrae's **biogas** wastewater treatment plant creates almost enough energy out of grease-trap water to run the entire facility. Pacifica is building a plant that will create **biodiesel** out of waste cooking oil and use it to power the wastewater treatment plant and city vehicles. Burlingame saves more than $80,000 a year because the co-generation system at the wastewater treatment plant provides 80 percent of the facility's needs.

**Fuel cells** and wind turbines are also eligible for state rebates, although they have not yet been deployed by Bay Area governments.

## Economic Opportunities

**The rising public concern about global warming and explosive interest in all things "green" have converged to create a red-hot market for clean technology companies.** Venture capitalists invested $2.9 billion in 2006 alone in North American companies in the energy, water, waste management and sustainability sectors.[19] Silicon Valley is an early leader in the bid to attract and nurture this new industry, although New England, Austin and Chicago are also vying for the honor.

San Mateo County is already home to more than a dozen clean technology companies, ranging from Tesla Motors, a San Carlos-based startup creating an all-electric sports car to Li*on, a Woodside company that makes lithium-ion batteries. Many more clean technology companies are based in Santa Clara and other Bay Area counties.

Local governments that hope to benefit from job growth and economic expansion from these new markets can take steps to attract and support the clean technology industry. **79 percent of venture capitalists surveyed said that public policies are a factor in their clean technology investment decisions. 91 percent said that a pro-environmental public policy can attract clean technology business to a region.[20]** Incentives, rebates and tax credits can also help make San Mateo County an appealing home for this new sector, which may someday be even larger and more influential than the information technology industry.

## Barriers to Conservation and Efficiency

USTF members and representatives from other cities consistently cite the lack of staff time, budget and technical expertise as key barriers to adoption of energy efficiency measures. California Local Energy Efficiency Program (California LEEP), a project that analyzed local energy efficiency programs across the state, confirmed that these challenges are widespread.

[19] *Cleantech Venture Capital: How Public Policy Has Stimulated Private Investment*, by Environmental Entrepreneurs (E2) and the Cleantech Venture Network, available from http://www.e2.org, under Publications (select Reports, then 2007 National Cleantech Report: Executive Summary (May 30, 2007).

[20] *Creating Cleantech Clusters: 2006 Update*, Clean Tech Venture Network LLC (2006).

California LEEP also found that energy efficiency projects stall because financial models and political timelines often optimize for quick payback and fast results—a poor match for some of the big-ticket measures that will provide the biggest impact over time.[21]

City staff and water agency experts report that water conservation efforts are even more difficult to implement. Water programs face the same shortages of time and expertise, and have far fewer funding sources than in the energy arena.

**The barriers are interrelated: without budget to hire sufficient staff, staff members don't have enough time to research, select, implement and manage resource conservation programs.** Local government officials seldom have the time to study and understand energy, water and climate issues, much less keep up to date on current program offerings and the latest technologies. Busy finance directors can seldom consider whether their standard short-term payback models are the best way to evaluate potential energy efficiency and water conservation measures.

## Available Resources

A growing number of resources are available to help cities, companies and residents reduce their energy use, thanks to the state's longstanding commitment to energy efficiency and growing concerns about global warming. **Cities and counties are eligible for financial assistance and technical resources to improve energy efficiency in civic facilities and operations**. These include, for example, free energy audits of civic facilities[22] and low-cost loans for energy-smart capital improvements.[23] Expert advice, rebates, special utility rates, training and educational programs are offered to local governments by a host of providers, ranging from the energy agencies to local nonprofit groups. Similar energy-saving programs are targeted at the business community by the same providers and by industry-specific groups. Still other resources are available to individuals.

Rebates on water-efficient fixtures and tips for conserving water are offered through local water suppliers. The Bay Area Water Supply and Conservation Agency, which was formed in 2003 by the agencies that buy water from San Francisco on a wholesale basis, provides assistance in developing and implementing water conservation programs with and for its member agencies.

The Energy Strategy brings together an extensive list of these financial, technical and educational resources. It provides context, data and analysis of the current situation, sets ambitious but achievable goals and identifies specific strategies and actions to help cities achieve the goals.

*The Energy Strategy brings together resources, context, data, analysis, goals, strategies, actions and recommendations.*

Finally, the Energy Strategy provides brief case studies about actions taken by local jurisdictions and their results. More extended case studies are provided for three San Mateo County communities that have pursued different paths toward energy efficiency, water conservation and climate protection. The extended case studies are offered so that cities facing similar challenges might learn from the experiences of their peers.

[21] A list of the barriers is included in the California LEEP report on p. 29, http://www.caleep.com/docs/CaliforniaLeep-SummitProceedings-May2004-FINAL.pdf.

[22] Audit and implementation services are available through the Energy Watch Partnership, the California Energy Commission and PG&E. See Appendix D, Energy Efficiency.

[23] The California Energy Commission offers low-cost loans to cities and counties for energy-efficient investments. See Appendix D, Financing/ Funding Sources.

Other resources that can help governments include the business community—which faces many of the same issues and opportunities as government—nonprofit organizations, residents, students, teachers, local universities and religious groups.

## Conclusions

The data show that continued growth in the rate of energy use in San Mateo County will lead to additional energy infrastructure, higher energy bills and more greenhouse gas emissions. Reducing energy use will instead bring benefits such as lower costs and cleaner air. Water supplies will become scarcer and more expensive in coming years, so conserving water makes economic and environmental sense. Saving water helps lower energy use as well.

Local governments that use resources wisely will be role models for their residential and business communities, and be well-positioned to deal with future regulatory and technological challenges as they arise.

Other Bay Area cities have already achieved dramatic reductions in energy use in recent years. **San Mateo County communities can build on their own and others' energy-saving experiences and reduce energy consumption countywide without experiencing any hardship.** The know-how, resources and technologies already exist. By working together and leveraging the region's diverse strengths, San Mateo County as a whole can move toward a cleaner, greener and more prosperous future.

# SECTION 4. GOALS

In accordance with its original charter and based on the context and findings, the Energy Strategy recommends five countywide goals that will help address the long-term energy needs of San Mateo County in an environmentally, socially and fiscally responsible manner. The goals address issues of collaboration, energy, water, economic opportunities and shared leadership.

## ENERGY

Energy provided by utilities generates greenhouse gas emissions and requires a complex infrastructure that affects the county as a whole. This goal is explicitly intended to decrease the demand for energy produced and delivered by utilities (electricity and natural gas).

Goal 1:

> **To support the state's greenhouse gas emission reduction targets, San Mateo County will reduce the amount of power it purchases from utilities to 25 percent below 2005 levels through conservation, efficiency and increased local production of clean energy.**

Improving **energy efficiency** lowers the overall demand for energy without imposing any sacrifice or hardship. Free services, new technologies and generous subsidies make saving energy easier than ever before.

Solar electric systems, fuel cells, biogas plants and other types of **clean, local generation** facilities are cost-effective and an environmentally sensitive way to meet energy needs. New subsidies and financing options also bring alternative energy systems within reach for most local governments, as well as many businesses and households.

## WATER

Enormous amounts of energy are consumed in the delivery the use and disposition of water, so water conservation is an excellent way to save energy. Because the region depends upon a single water supply which is vulnerable to drought and changing weather patterns, water conservation also helps mitigate the risk of future shortages. This goal is explicitly intended to decrease the demand for water purchased from the Hetch Hetchy regional water system.

Goal 2:

> **To ensure there is no net increase in water diversions from the lower Tuolumne River, San Mateo County will conserve and recycle water, and develop other local water supplies, as needed. Specific Target?**

Upgrading to high-efficiency fixtures and equipment is a painless and cost-effective way to conserve water. Increasing the use of reclaimed and recycled water for non-potable needs will help ensure that the critical needs will still be met as conditions evolve.

## COLLABORATION

The issues addressed in this Energy Strategy grow more complex every year. Communities will be better able to respond to environmental challenges and opportunities by working across sectors and sharing information and ideas.

Goal 3:

**To address environmental challenges more effectively and efficiently, San Mateo County will partner with the public utilities and work across city boundaries.**

## ECONOMIC OPPORTUNITIES

Attracting businesses that address environmental challenges can help the local economy; fostering their success may have a positive global impact, as happened with the high technology industry.

Goal 4:

**To strengthen the long-term economic health of the county, San Mateo County will support the clean technology sector.**

## SHARED LEADERSHIP

Big challenges need many leaders with diverse and complementary skills. Individual communities and the region as a whole need the active involvement of government staff, elected officials, business leaders, residents, teachers and other interested parties if the benefits of the Energy Strategy are to be realized.

Goal 5:

**To achieve the goals of the Energy Strategy, San Mateo County will encourage environmental leadership in all government departments, the business community and residents.**

* * * * * * * *

Working together, these goals are achievable, and help to make San Mateo County a leader in the statewide effort to improve energy efficiency, conserve water and embrace clean energy.

The remainder of the Energy Strategy offer explicit guidance on how to meet these goals.

# SECTION 5. STRATEGIES

This section of the Energy Strategy sets forth the high-level strategies that can help San Mateo County governments, businesses and residents achieve the Energy Strategy goals. Specific actions to support the strategies are outlined in depth in Section 6. Resources to help implement the actions are provided in Appendix D.

## ENERGY

**Make energy conservation and energy efficiency standard practice.**

**Promote cleaner and greener sources of energy.**

## WATER

**Make water conservation and recycling standard practice.**

**Partner with other Hetchy Hetchy regional water system customers to preserve the Tuolumne River.**

## COLLABORATION

**Partner with public utilities for mutual benefit.**

**Collaborate with other jurisdictions to save time and resources.**

## ECONOMIC OPPORTUNITIES

**Encourage clean technology businesses to locate in the county.**

**Help accelerate the adoption of clean technologies, both locally and globally.**

## SHARED LEADERSHIP

**Invest in environmental expertise in local government.**

**Recruit and support community leaders at every level.**

# SECTION 6. RECOMMENDED ACTIONS

This section provides more detail about the strategies and recommends specific actions to help local governments meet the goals outlined in Section 4. Actions are categorized as *Easy/ Short-term*, *Intermediate/ Medium-term* or *Advanced/ Long-term*. In general, the easy actions should be quick to implement (0-3 months), the intermediate actions may take several months and advanced actions might require a year or more of planning.

The Case Studies refer to other communities that have successfully implemented the suggested action. *Additional resource information is available in Appendix D; the relevant section heading is listed in parentheses following each entry.*

## ENERGY

### GOAL

**To support the state's greenhouse gas emission reduction targets, San Mateo County will reduce the amount of power it purchases from utilities to 25 percent below 2005 levels through conservation, efficiency, and increased local production of clean energy.**

### STRATEGY

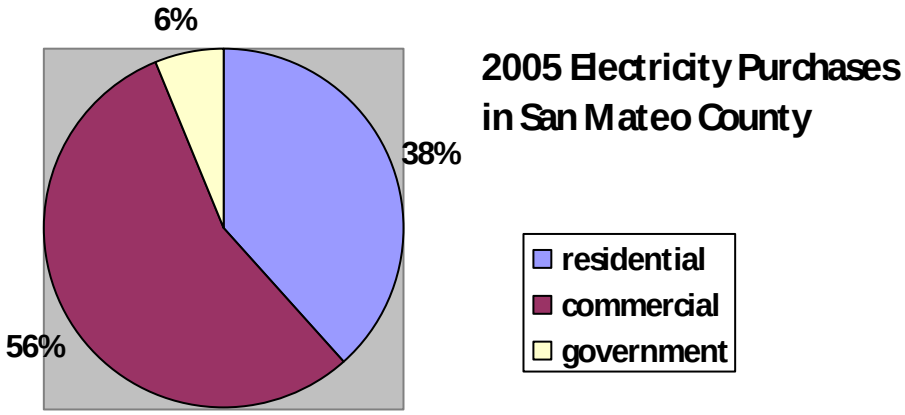
*Make energy conservation and energy efficiency standard practice.*

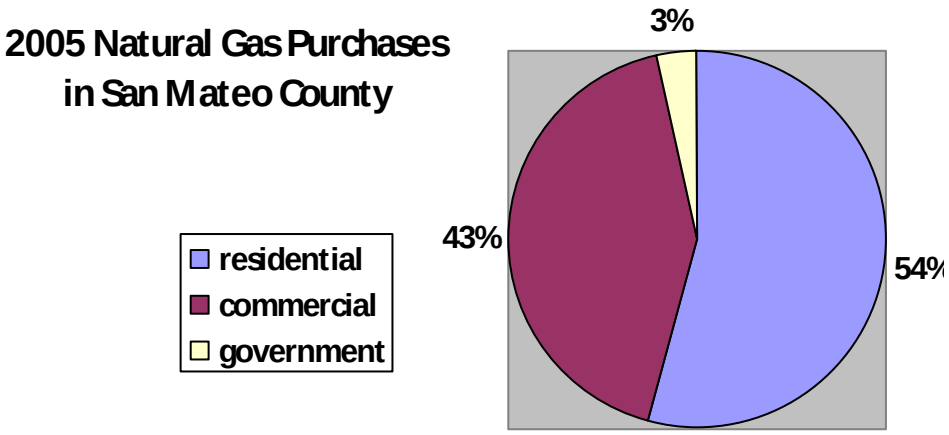
Energy efficiency is a way of life in many parts of the world where the infrastructure is less reliable or the cost of energy is higher than it is in the U.S. Increasing energy prices and global warming mandate that Bay Area communities adopt this approach as well.

#### 1. Understand baseline use.

Without understanding current use levels, it's impossible to know which targets will yield the greatest impact or to measure the effectiveness of specific energy-saving measures.

PG&E has provided the data for kilowatt hours of electricity and therms of natural gas sold in San Mateo County in 2005. The data show that 55.49 percent of the electricity was delivered to commercial customers, 38.37 percent went to residential customers and 6.1 percent went to government agencies (the County, a city or a special district). In contrast, residents purchased 54 percent of the natural gas sold, commercial customers bought 42.7 percent and districts were responsible for a mere 3.2 percent of the total.




The Bay Area Air Quality Management District is sponsoring free workshops to help each Bay Area local government develop a baseline greenhouse gas emissions inventory for its community. **The Energy Strategy recommends that all cities and the County use the data provided by PG&E to develop their own baseline, in a format consistent with the one used in the Air District workshops.** Doing so will make it easier to correlate individual communities and agencies against the countywide baseline and to track progress toward the Energy Strategy goals.

Local governments can develop their baseline energy use for operations from their utility bills or by getting the data from PG&E. Cities that participate in the ICLEI /Sustainable Silicon Valley/ Joint Venture Silicon Valley Climate Protection Task Force program for emissions inventory program will have the information provided to them. Otherwise, a city can request the data directly from PG&E.

### 2. Create a plan.

The baseline data for the county as a whole and for each jurisdiction will provide only a starting point for an energy purchase reduction plan, not the details. An analysis of the largest energy users and their current efficiency levels will be needed to target energy reduction and production projects.

Local governments can play a leadership role by reducing energy use in public facilities and civic operations. Doing so will save taxpayer money and set a good example for others.

### *A. Improve government facilities and operations.*

Several programs are designed to help cities identify and fund energy efficiency projects. PGE's Energy Watch Partnerships provide free assistance to local governments, small businesses and residents to significantly reduce energy use. The Associated Bay Area Governments (ABAG) Energy Watch Partnership is open to all local Bay Area governments and agencies. The Silicon Valley Leadership Group and Sustainable Silicon Valley Energy Watch program is open to members of either of the nonprofit organizations. The California Energy Commission Energy Partnership Program offers a similar array of services to public, nonprofit and educational entities.

The energy consultants with such programs can help city staff analyze utility bills to identify which facilities are the most energy-intensive and which offer the biggest opportunities for savings. The consultants can then perform a detailed energy audit and suggest specific measures based on the upfront cost, expected energy savings and long-term financial benefits. The programs do not cover the cost of implementing the recommended measures (such as the installation of a new chiller, boiler or pump), but energy consultants can help city staff find funding sources and contractors to do the work. Governments that have participated in such programs and implemented the recommendations have saved millions of dollars and reduced energy purchases from utilities by millions of kilowatt hours.

**The Energy Strategy recommends that local jurisdictions start by enrolling in an energy efficiency audit and services program if they have not already done so.** An application is required to join the Energy Watch and Energy Partnership programs and other criteria apply. More information is in the Energy Efficiency section in Appendix D.

### *B. Integrate energy efficiency into government policies and processes.*

To ensure that its policies and actions are aligned, local jurisdictions may wish to verify that their General Plan encourages resource conservation. If the Plan includes older elements that conflict with energy-efficient policies, water conservation practices or clean energy production (i.e. solar panels), officials should consider updating or adding a new element at the next revision of the General Plan. Energy Watch and other resources are available to help with this process. See more in this section under **Actions** and in the Ordinances and Policies section of Appendix D.

Financial policies should also be reviewed and updated as needed to reflect current environmental and economic realities. The financial constraints under which local governments operate make it easier to approve projects that show a quick payback (i.e. pay for themselves within 2-5 years) than larger capital investments that take longer to be recouped but provide greater long-term returns. Adding cashflow and internal rate of return analyses to the financial review process will provide more data on which to select energy efficiency and renewable energy measures.

Using the money saved from one project to fund or find others is another way to stretch scarce dollars. Some cities use energy savings to pay for staff positions that look for grant money and identify the most financially attractive measures.

### *C. Use incentives and ordinances to change behaviors.*

A local government can encourage residents and local businesses to use less energy use and/or produce their own clean energy through the exercise of its regulatory authority.

*Voluntary programs have proven effective in many Bay Area cities.* These include using green building guidelines[24] for educational purposes, or as the basis for a condition of approval for certain types of permits or

[24] The San Mateo Countywide Guide to Sustainable Buildings and the Build It Green (BIG) single-family and multi-family Green Building Guidelines outline dozens of ways in which new buildings or renovations can be made energy efficient.

to qualify for expedited permitting. Some Bay Area governments (Berkeley, Marin County) offer technical assistance and give public recognition to projects that exceed basic energy requirements.

*Incentives are a low-cost and high-impact way to change behavior.* Incentives usually save a permit-seeker time, money or both. PG&E and the CEC offer financial incentives for builders of new homes and commercial buildings to use energy-efficient design techniques, appliances and lighting. Several San Mateo County cities have reduced or waived solar permit fees to encourage residents to generate their own power. Some neighboring counties (San Francisco, Marin) now offer a speedier permitting process for projects that meet a specific green or energy efficiency standard. The programs achieve faster turnaround time either through coordinated inspections, fast-track status or over-the-counter permits. See more examples of incentives under the Financing/Funding Sources and Ordinances & Policies sections in Appendix D.

*Mandatory energy efficiency and green building ordinances have the greatest impact.* Some jurisdictions may hesitate to pass ordinances requiring energy-efficient behavior, but they are the surest way to achieve results.[25] Because buildings are responsible for more than 50 percent of the energy used in the U.S. today, policies that demand more energy-efficient structures are essential to reducing greenhouse gas emissions.[26] Existing knowledge and materials can increase the energy efficiency of most buildings by 15-50 percent, reaping long-term savings of both resources and money.

California building codes are expected to become more stringent on energy efficiency and green building issues by 2009.

## ACTIONS

### *Easy/ Short-term*

- Use PG&E bills or data to understand the 2005 energy use by sector in your community and in government operations, and use it as a baseline against which to measure reductions in power purchases. Use a format that is consistent with the one used in the Air District's free greenhouse gas inventory workshops.

- **Enroll in an Energy Watch or Energy Partnership program** for help in assessing energy-saving opportunities in government facilities and operations, detailed building audits, policy assistance and numerous other tasks. Priority is given to government agencies that are willing and able to implement energy-saving actions that deliver quantifiable reductions in electricity and natural gas use. (Energy Efficiency > SERVICES)

- Use a for-profit **Energy Service Company** (ESCO) to conduct free energy audits and recommend equipment upgrades as an alternative to or in addition to using Energy Watch or Energy Partnership services. Under an Energy Savings Performance Contract, the ESCO will buy, install and maintain energy-efficient equipment in government facilities at a guaranteed savings to the city. An ESCO may also offer a Power Purchase Agreement, under which a government agency agrees to buy power generated by the ESCO (usually generated by a solar electric system on the agency's facility) under a long-term, fixed-price contract that costs less than the agency's current utility rates. (Energy Efficiency > SERVICES)

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Rating systems like BIG Green-Point Rated and the Leadership in Energy and Environmental Design (LEED) can have the same effect.

[25] Recall that California's strong energy efficiency standards for buildings and appliances have kept per capita energy use flat for 30 years, compared to huge increases elsewhere.

[26] The U.S. Council of Mayors and several cities and counties have endorsed the 2030 Challenge, an architect-led initiative to make all buildings carbon-neutral by 2030. See http://www.architecture2030.org/.

- Replace **lighting** in all government facilities with the latest energy-efficient technologies, including compact fluorescent and high-efficiency, T8 linear fluorescent lamps**.** (Energy Efficiency > Lighting)

*Intermediate/ Medium-term*

- **Develop a plan for how your community can reduce energy purchases and/or increase local clean energy production** (for example, by encouraging solar electric systems, fuel cells or other innovative methods). Assign existing staff, or hire an energy manager, climate action coordinator or consultants if possible. If neither staff nor funds are available, recruit a citizen task force and/or get interns from local colleges to help.

- **Establish an implementation action plan** for initiating and completing specific energy-efficient projects in government facilities and operations that are suggested by the Energy Watch audits and other investigative efforts.

  Case study: An ABAG Energy Watch audit revealed that San Mateo County could save nearly 4 million kilowatt hours of electricity, 180,000 therms of natural gas and more than $600,000 by optimizing heating, ventilating, and air-conditioning (HVAC) controls and systems in its facilities.

- **Update General Plans** to advance energy efficiency policies and encourage alternative and renewable energy sources. (Ordinances & Policies > GENERAL PLANS)

  - Create an Energy Element that specifically addresses energy issues and update existing language within the required seven elements (land use, circulation, housing, conservation, open space, noise and safety) and any optional elements to reflect energy goals.

  - Ensure language in the Energy Element provides support for existing or future energy efficiency programs, policies and projects.

  - If updating the General Plan is a barrier, identify existing language that supports energy efficiency measures and use it as a basis for implementing programs.

- **Update Strategic Plans** to consider the impact of rising energy costs and shifting energy sources (from fossil fuel to renewable) when making or assessing long term planning decisions.

- **Adopt a green building policy for new public construction**. (Ordinances & Policies > POLICIES)

  - Hire architects and builders with significant green building experience to keep costs in line with traditional buildings and build in long-term operational savings.

  - Use case studies, financial analyses and local municipal green building success stories to increase political support for the standard.

  - Consider identifying a specific LEED level (Certified, Silver, Gold or Platinum) as a goal, regardless of whether the building will go through the certification process.

  Case study: Alameda County built its Juvenile Justice Center to the LEED Silver standard and reduced energy consumption to 46 percent below Title 24 and water consumption to 41 percent below code.

- **Adopt energy efficiency and green building ordinances** applicable to the residential and commercial sectors to make energy efficiency the standard practice in your community. (Ordinances & Policies > ORDINANCES)

- Review the General Plan, programs, policies and codes to identify areas that support or inhibit energy efficiency or green building ordinances. Garner political backing.

- Educate staff, public, builders/designers/developers and policy makers on energy efficiency methods, green building, rating systems and ordinance processes.

- Ask staff in the planning, building and public works departments to help identify the building types in your community and the "triggers" (events) with the greatest potential for energy savings (e.g. residential or commercial; commercial tenant improvements, residential remodels or time of sale retrofits).

- Review and consider adopting ordinances similar to those used in other jurisdictions to strengthen regional consistency. Builders, designers and developers are more ready to adapt to new rules if they are common throughout the area.

- Engage stakeholders to provide input on using a voluntary versus mandatory policy and preferred standards, to help create an implementation plan and build community support.

- Analyze the fiscal impact of the ordinance, determine funding sources and project the measurable outcomes. Estimate the potential energy savings based on the average number of trigger events per year and the proposed standard (e.g. "15 percent below Title 24").

- Understand the legal framework for implementing an energy efficiency and or green building ordinance in relation to Title 24 and the California Building Codes Standards (CBCS). Conduct an energy study and submit ordinance to CEC and CBCS for approval, if required.

- Consider implementing an energy efficiency ordinance as the first step toward a green building ordinance.

Case study: Rohnert Park adopted an energy efficiency ordinance as well as a green building ordinance, using the LEED rating system as the reference standard for commercial buildings and GreenPoint Rated for residential buildings.

Case Study: San Francisco plans to adopt a *mandatory* green building ordinance applicable to private development of all new commercial buildings over 5,000 square feet, major alterations and new residential construction projects. LEED and GreenPoint Rated are the reference standards (for commercial and residential buildings, respectively), with increasingly stringent requirements to be phased in over a five-year period.

- Update **financial tools** to include long-term operational savings and avoided costs as well as first costs or retrofit costs in cost-benefit analyses, and look at the internal rate of return and cash flow as well as simple payback. (Financing/Funding)

  Case study: Sebastopol balanced low-cost, quick payback projects with long-term, bigger impact ones in its 20-year plan. The projects will provide positive cash flow for 19 of the 20 years.

- Form **revolving funds** to pay for ongoing efficiency measures through energy savings. (Financing/Funding > REVOLVING FUNDS)

  Case study: Ann Arbor Michigan's $100,000 initial energy efficiency fund paid for itself in eight years.

- Use energy savings to fund new staff positions and additional energy measures from energy savings or rebates.

Case study: The City of San Jose used a $300,000 rebate from PG&E to fund an energy officer position for two years.

- Sign up for the **demand response** program from PG&E to receive lower rates in exchange for reducing use during peak demand. (Financing/ Funding > DEMAND RESPONSE PROGRAM RATES)

### *Advanced/ Long-term*

- Install **energy accounting or utility management software** to monitor energy use, spot trends and identify opportunities for savings. (Energy Efficiency > AUDIT/ASSESSMENT > Software)

  Case study: Oakland saved $200,000 in the first year after it implemented a Utility Management System by discovering numerous accounting errors.

## STRATEGY

### *Promote cleaner and greener sources of energy.*

Clean, renewable energy sources are now more affordable than ever before. Local governments, businesses and individuals can produce and use clean energy by investing in **solar electric**, **solar hot water** and other renewable energy systems. Solar electric systems for homes cost about as much as a car, depending on the size of the home, energy consumption patterns and physical set-up. For commercial and public buildings, the size, upfront cost and long-term economic benefits are usually far greater. Rebates, tax credits and other financial incentives lower the initial cost of these systems, but the ability to pre-purchase 25 to 40 years of electricity reduces the risk associated with energy rate increases.

A solar hot water system is another relatively low-cost (less than $10,000 for the average home, installed) and low-tech source of clean energy. It uses the sun's rays to heat water or other fluids instead of using fossil fuels to do so. Solar fans are the cheapest and easiest form of alternative energy: for a few hundred dollars, they can help keep a building cool without using any energy from the grid.

**Co-generation**, **biodiesel**, **biogas** and **fuel cell** systems all capture and use waste energy to reduce or eliminate the need to use electricity or natural gas. Rebates and other financial incentives are available to help with the upfront cost, and they deliver the same long-term financial advantages as solar electric systems.

Even if a building owner prefers not to buy and maintain a renewable energy system, it can still use clean energy and save money. For-profit companies called **Energy Service Companies** (ESCOs) will often purchase, install and maintain an alternative energy system on government or commercial facilities. The company will then sell the power generated by the system to the building owner for less than the current cost of grid-supplied energy under a long-term Power Purchase Agreement. The contracts lock in the per-kilowatt hour electricity rate, guaranteeing the owner won't be affected as utility rates continue to increase.

For those who wish to learn more, PG&E offers several classes on solar and other renewable energy systems at the Pacific Energy Center in San Francisco. Technical evaluations of renewable energy systems are available through the Energy Watch program.

## ACTIONS

### *Easy/ Short-term*

- **Reduce or eliminate** permit fees for solar electric and solar hot water systems to encourage their widespread adoption. (Ordinances & Policies > ALTERNATIVE ENERGY > Incentives)

- Invite Solar City or another solar installer to offer **group discounts to city residents.** (Purchasing > PURCHASING POOLS > Neighborhood groups > Solar systems)

  Case study: 77 Portola Valley homeowners installed 355 kilowatts (kW) of solar capacity under the Solar City Collective Power program, increasing the total amount of solar electric systems in their community by 50 percent. In Woodside, 21 households installed 213 kW of capacity and in Mountain View, 119 homes installed 362 kW of solar electric power under the same program. Other communities are running similar programs.

- Encourage, incent or require new construction and major renovation projects to **pre-plumb for solar hot water and pre-wire for solar electric systems**. Renewable energy systems can then be added later quickly and inexpensively.

- Install **solar fans** where appropriate to reduce cooling costs and increase occupant comfort.

### *Intermediate/ Medium-term*

- Consider providing a **rebate** to residents and local businesses that invest in solar electric, solar hot water and/or other clean energy systems.

  Case study: Millbrae offers rebates between $200 and $950 to help offset the expense of installing solar electric, solar hot water and/or solar pool heating systems. The Millbrae rebates are available to residents and business owners, and are on top of state and federal financial incentives. (Ordinances & Policies > Incentives)

  Case study: Belmont has proposed offering a $500 credit toward city services to residents that purchase a hybrid car. The credit could be applied to swimming lessons, parking permit fees or other voluntary services offered by the city.

- **Adopt ordinances** that incent or require residents and businesses to install alternative and renewable energy sources, such as solar electric and solar hot water systems. (Ordinances & Policies > ORDINANCES)

  Case Study: Marin County requires single family dwelling units of more than 3,500 square feet to use no more energy than a 3,500 square foot home. Homeowners can meet the requirements through energy efficiency and/or the use of renewable energy systems.

- **Adopt ordinances for residential new construction developments** that require a certain percentage of new homes to come with rooftop solar electric as standard installation, and/or a percentage of homes to be built "PV-ready" in terms of roof construction and solar access.

- Install **solar hot water** systems at city facilities, especially swimming pools.

- Recruit and train **Green Energy Experts** on staff and in the community.

### *Advanced/ Long-term*

- After making facilities as energy-efficient as possible, install **solar electric** panels on city facilities, either through purchase or under a Power Purchase Agreement with an ESCO. (Energy Efficiency > SERVICES > ESCOs)

Case Study: 1800 solar panels produce 10-15 percent of the energy used at the wastewater treatment plant in Pacifica, worth an estimated $100,000 per year in savings.

- Develop **co-generation**, **biogas**, **biodiesel** or **fuel cell** sources at city facilities.

  Case Study: Millbrae's biogas plant collects 3000 gallons of restaurant kitchen grease daily and converts it into methane gas. The gas fuels a 250-kilowatt co-generation system that can produce 1.7 million kilowatt hours per year, or 80 percent of the wastewater treatment plant's needs.

  Case Study: Burlingame saves $80,000 per year on its energy bills and received a $160,000 rebate from PG&E for its co-generation wastewater treatment plant. The plant uses naturally produced methane gas to create renewable energy and provide backup power during utility outages and emergencies.

  Case Study: Pacifica is building a biodiesel plant which will convert waste vegetable oil into power that will run the plant, the adjacent wastewater treatment facility and a portion of the city's fleet. The city expects to save $200,000 a year in energy costs.

## WATER

### GOAL

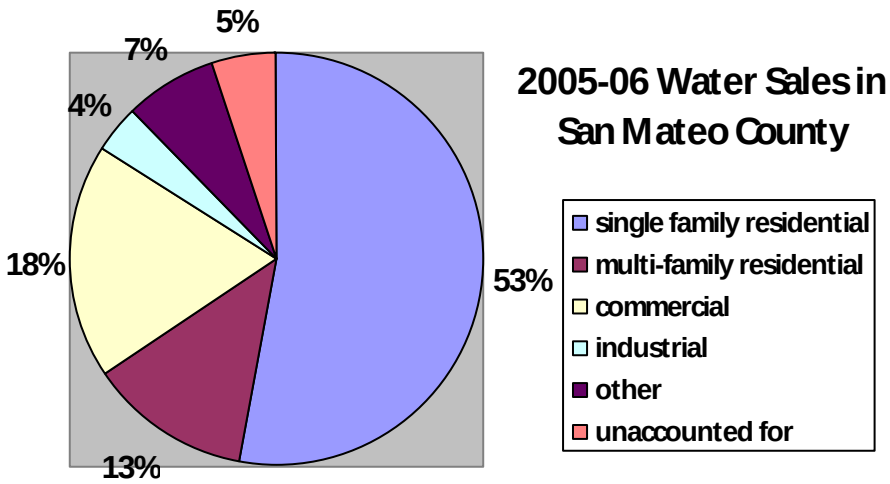
**To ensure there is no net increase in water diversions from the lower Tuolumne River, San Mateo County will conserve and recycle water, and develop other local water supplies, as needed.**

### STRATEGY

*Make water conservation and reuse standard practice.*

#### 1. Understand baseline use.

Water sales data is published in the BAWSCA Annual Report and is broken out by water district, jurisdiction and sector. Single family residences account for just over half (52.8 percent) of the water sold in the county, with commercial activity at only 18.5 percent. Three other categories make up the remainder, as shown.



Per-capita water use throughout the Hetch Hetchy regional water system has decreased in recent decades as residences and businesses have become more water-efficient. In 2005-2006, the average water use level was 88 gallons per person per day, 15 percent lower than in 1986-1987 (before the last drought) and 23 percent lower than the 1976-1977 levels. However, when best management practices are implemented, the average per person daily use is 50 gallons or lower.

## 2. Create a plan.

State and federal government funding isn't as readily available for water conservation programs as it is for energy efficiency, so programs are usually funded from local water rate revenues and implemented by the local water supplier. Projects that save both water and energy (such as retrofitting cooling towers in commercial or government facilities) may be covered by energy-efficiency programs and funding. With water prices in the Hetch Hetchy system expected to triple by 2015, there are significant economic benefits for all sectors to implement cost-effective water conservation.

### *A. Improve government facilities and operations.*

Local governments can save money and water by installing high-efficiency fixtures in City Hall, libraries, fire stations, police facilities and public recreation areas. Drought-tolerant plants and high-efficiency irrigation systems also reduce water use and can serve as demonstration projects for community members to see and emulate.

### *B. Integrate water conservation and reuse into policies and practices.*

As with energy, jurisdictions may wish to review their General Plan to ensure it promotes water conservation and reuse, and update it as needed during the next revision cycle. The financial analysis for any proposed water conservation project should reflect the significant rate increases that will take effect in 2015, and account for the risk that more water may simply not be available at any price.

**Water is as critical to the health and quality of life in San Mateo County as energy, but there are no viable substitutes.** Given the ever-present risk of drought, the aging Hetch Hetchy water delivery infrastructure and the competing demands of agriculture, wildlife and humans, jurisdictions may need to rethink longstanding assumptions about water.

Arid regions like Arizona and New Mexico have accepted residential and commercial greywater systems as a necessity, and San Mateo County may wish to consider doing the same. Similarly, communities that may once have been uncomfortable using recycled water for parks and lawns may now find that it is an acceptable option both technically and socially. Improvements in artificial turf now make it an attractive substitute for grass playing fields both economically (lower maintenance costs, more playing days) and environmentally (eliminating the need for water and pesticides).

### *C. Use incentives and ordinances to change behavior.*

Ordinances can be used to incent or mandate commercial and residential building owners to choose water-efficient appliances and landscaping practices. Local governments are required by state law[27] to adopt a landscape water conservation ordinance by Jan. 1, 2020 that is at least as effective as the model ordinance developed by the California Water Resources Board. The model ordinance promotes the use of recycled water, climate-appropriate plants, capture and use of stormwater on-site and weather-smart irrigation controllers. Jurisdictions can recoup the cost of adopting the ordinance from the state.

Local governments may choose to offer financial incentives to help offset the cost of water-saving plumbing fixtures or irrigation equipment if it is necessary or desirable to do so. Communities may also wish to consider

[27] AB 1881, the 2006 update to the Water Conservation in Landscaping Act.

permitting **greywater** and other water reuse systems, at least on a pilot basis. At minimum, new buildings and renovations should be encouraged to include dual plumbing to facilitate a future greywater system.

Water agencies can influence customer behavior by implementing tiered rate structures for water and sewer that encourage water conservation and reuse.

## ACTIONS

### *Easy/ Short-term*

- Replace older, inefficient toilets in city facilities with **high efficiency toilets** that use 20 percent less water per flush. (Water Conservation > FIXTURES > Toilets)

- Ensure city facilities use **drought-tolerant plants** and appropriate water conserving irrigation (**drip irrigation or "Smart Controllers").** (Water Conservation > Landscaping)

- Buy **recycled water** to use on golf courses, playing fields and for other irrigation needs. (Water Conservation > LANDSCAPING > Recycled water)

  Case Study: Daly City currently produces and delivers 5.5 million gallons per year of recycled water to three neighboring golf courses, other city parks and open space areas.

- Switch to **artificial turf** for playing fields. (Water Conservation > LANDSCAPING > Parks and open spaces)

  Case Study: Redwood City replaced one of its playing fields with turf and saved 2.8 million gallons of water a year and decreased maintenance costs. It plans to replace six additional fields with turf.

- **Adopt tougher water conservation ordinances** and enforce compliance with existing water conservation ordinances (e.g. landscape ordinances). (Ordinances & Policies > WATER CONSERVATION)

- Offer **financial incentives** to offset the purchase price of high-efficiency toilets, smart irrigation controllers, high-efficiency washing machines and other water-saving appliances.

  Case Study: When Redwood City purchased more water from San Francisco than it was allotted, it instituted a high-efficiency toilet program. The city put demonstration models on display, sponsored a free "give-away" of the high-efficiency toilets, installed them for multi-family and non-residential customers and gave rebates to residential customers for the purchase of qualifying toilets. Within 36 months, 6500 toilets were replaced for an estimated *annual* water savings of 200 acre-feet or 65,170,200 gallons.

- **Implement a water-conserving rate structure** intended to signal the need to conserve, and to potentially provide funding for water conservation programs.

  Case Study: Burlingame's water and sewer rates are helping tip the balance in favor of installing high-efficiency toilets at major hotels during renovations. At a cost of $200 per toilet, the annual water savings are 2,683 gallons per fixture per year, with a simple payback of three years. A hotel will save $4.69 for every 1,000 gallons on their potable water bill and $7.62 per 1,000 gallons on the wastewater bill.

- Encourage local home improvement and plumbing fixture stores to expand their selection of high efficiency toilets, faucets and other plumbing fixtures.

- Encourage local businesses to install **high-efficiency toilets** that use 20 percent less water per flush and **sensor-activated sinks** in high-traffic areas.

- Encourage local nurseries to promote climate-appropriate plants, and urge local businesses to landscape with native, adaptive and drought-tolerant plants.

  Case Study: Alameda and Contra Costa Counties have implemented **Bay-Friendly Landscaping Guidelines** for landscapers, nurseries and homeowners to reduce water use, eliminate pesticides and reduce runoff to the Bay.

- **Increase public awareness** of the value of water and the importance of water conservation and landscape water use efficiency and inspire them to action.

- **Promote available rebate programs** for high-efficiency washing machines, urinals, and toilets. (Water Conservation > REBATES)

- Encourage, incent or require new construction and major renovation projects to **pre-plumb for greywater systems**. The systems can be completed at a later time at lower cost and with greater ease.

- **Support activities that will increase the efficiency of water use by other users** of the Hetch Hetch water system to prevent additional diversions from the Tuolumne River and to protect against future shortages.

### *Intermediate/ Medium-term*

- **Update General Plans** and municipal codes to include water conservation and reuse policies and support the new state-mandated landscape guidelines. (Ordinances & Policies > WATER CONSERVATION > General Plan).

  - Review the General Plan and identify existing language relevant to water use and efficiency.

  - Update the language within the current seven elements (land use, circulation, housing, conservation, open space, noise and safety) or create a new Water Element that specifically addresses water efficiency and reuse.

- **Update Strategic Plans** to consider the impact of rising water rates and decreasing availability on long-term planning projects.

- **Consider permitting greywater systems**, at least on a pilot basis.

  Case Study: Two pilot systems in Oakland showed savings of more than 20 gallons per person per day. San Francisco and Berkeley have each recently permitted a limited number of greywater systems.

# COLLABORATION

## GOAL

To address environmental challenges more effectively and efficiently, San Mateo County will partner with the public utilities and work across city boundaries.

## STRATEGY

### *Partner with public utilities for mutual benefit.*

Local governments and utilities alike benefit when they work together to minimize community disruptions and coordinate planning efforts. Jurisdictions that take a pro-active role in understanding the issues affecting energy, water and other infrastructure providers will be better able to prepare themselves for known and unexpected developments such as water rate increases and storm-related power outages.

In areas where local governments and utilities share a policy perspective, they may wish to work together on issues at the regional or state level.

## ACTIONS

### *Easy/ Short-term*

- Review quarterly updates from PG&E representative about upcoming utility projects and take action as required.
- Consider adding an environmental line item to City Council agendas where status and issues concerning energy, water and climate efforts can be addressed.

### *Intermediate/ Medium-term*

- Support the passage of net-metering legislation at the state level to allow cities to "sell" their excess self-generated energy to the utility and apply the credits to their other government accounts

## STRATEGY

### *Collaborate with other jurisdictions to save time and resources.*

Cities within San Mateo County vary in geographic size, population, affluence, political climate and level of commercial and industrial activity. The communities also differ in terms of the type and quantity of energy efficiency and water conservation measures already implemented.

Despite these differences, every community shares some key traits with several of its neighbors. Each jurisdiction may be able to save significant time and money—and minimize risk—by collaborating with other cities facing similar challenges.

The 21 jurisdictions in the county are compared below along four dimensions: average household purchases of both electricity and water, and the percentage of residential purchases compared to total purchases of electricity and water. The colors are used to highlight the highest and lowest scores in each category; the uncolored areas indicate an average or more balanced score. Communities can use the color-coding to see which other jurisdictions might face similar challenges and opportunities when designing and implementing programs to decrease energy and water purchases.

*Electricity and water purchase levels*

| *Jurisdiction* | *average annual household electricity purchases (kWh)*[1] | *average annual household water purchases (gallons)*[2] | *% electricity purchased by residents (vs. other sectors)* | *% water purchased by residents (vs. other sectors)* |
|---|---|---|---|---|
| Atherton | **19,573** | **148,104** | **78** | **83** |
| Belmont | **5608** | **44,880** | **56** | **61** |
| Brisbane | **4693** | **32,912** | **13** | **29** |
| Burlingame | **4966** | **34,408** | **26** | **40** |
| Colma | **4114** | **30,668** | **7** | **38** |
| Daly City | **4880** | **36,652** | **50** | **57** |
| East Palo Alto | **5227** | **53,108** | **48** | **73** |
| Foster City | **5547** | **31,416** | **36** | **33** |
| Half Moon Bay | **6617** | **52,360** | **37** | **48** |
| Hillsborough | **15,028** | **266,288** | **90** | **89** |
| Menlo Park | **5928** | **87,516** | **20** | **58** |
| Millbrae | **5529** | **48,620** | **45** | **49** |
| Pacifica | **5242** | **47,124** | **65** | **71** |
| Portola Valley | **12,957** | **149,600** | **72** | **83** |
| Redwood City | **5238** | **44,880** | **24** | **46** |
| San Bruno | **5313** | **53,856** | **39** | **71** |
| San Carlos | **6094** | **55,352** | **34** | **56** |
| San Mateo | **5413** | **52,360** | **16** | **55** |
| South San Francisco | **4905** | **50,116** | **16** | **41** |
| Woodside | **18,340** | | **79** | **68** |
| unincorporated San Mateo County | **7300** | **88,264** | **56** | **74** |

**Key:** Lowest average household purchases / Highest average household purchases — Lowest percentage residential / Highest percentage residential

The data suggest the kind of measures and programs that would have maximum impact within a community via outreach, incentives or regulation.

**Measures that have worked well in one city are likely to work well in similar communities.** By sharing the "lessons learned" and financial analyses from past projects, staff from one jurisdiction can help their neighbors

[1] Source: PG&E; the data in column 3 is derived from the same source.

[2] The water consumption data per jurisdiction is derived from BAWSCA's Annual Report; the number of households per jurisdiction is taken from PG&E data. The data in column 4 is derived from the same source.

save time and reduce the risk of implementation pitfalls, and be helped by others in turn. The Joint Venture Silicon Valley Network Climate Protection Task Force is a forum for cities to share such information and develop common strategies for and lowering energy use and reducing greenhouse gas emissions.

Working together, one city might choose to develop a program for multi-family buildings while another investigates water conservation options at golf courses. A third might target office buildings and a fourth might focus on hotels and restaurants. By sharing their research and results of their efforts, every community can save time and the region as a whole can reach its resource purchase reduction goals.

### ACTIONS

*Easy/ Short-term*

- **Collaborate** with other cities that have similar results from their baseline inventories and share some of the traits listed above. Compare notes on past resource-saving efforts and develop common strategies where appropriate.

- **Join the Joint Venture Silicon Valley Climate Protection Task Force** to share best practices, develop common strategies, access technical resources and get discounts on energy-saving or energy-generating equipment purchased in quantity. (Organizations > JOINT VENTURE SILICON VALLEY NETWORK)

## ECONOMIC OPPORTUNITIES

### GOAL

**To strengthen the long-term economic health of the county, San Mateo County will support the clean technology sector.**

### STRATEGY

*Encourage clean technology businesses to locate in the county.*

The "green" market is now the fifth largest sector in the U.S., providing jobs and attracting capital and an increasing range of customers. The clean technology sector is already being compared to the high tech industry as a long-term growth engine for Silicon Valley. Venture capitalists are investing in startups that are developing alternative energy solutions, water-saving devices and energy-efficient equipment. New technologies will come to market and the economic impact of the green economy will spread throughout the region.

Jurisdictions can attract these businesses by accentuating the availability of a highly skilled workforce, excellent schools and worker training programs and the high quality of life in the area. They may also wish to offer tax or other incentives as appropriate.

### ACTIONS

*Easy/ Short-term*

- Establish a **working group** of economic development staff across the county to develop strategies and tools to attract clean technology companies. Encourage SAMCEDA to work with the local chambers of commerce

to target companies in the energy, water, green building, sustainable design, recycling and waste management industries.

### *Intermediate/ Medium-term*

- Consider offering **tax or other incentives to attract clean technology businesses** to San Mateo County.

- Urge the Workforce Investment Board, local community colleges and universities to offer classes and job training programs to meet the needs of clean technology employers (such as solar installation

## STRATEGY

### *Help accelerate the adoption of clean technologies, both locally and globally.*

Local governments can help foster the growth of green technologies by evaluating—and if suitable, adopting—products or services that reduce energy consumption, generate clean energy, lower greenhouse gas emissions, conserve or recycle water, reduce waste, increase the use of recycled materials or otherwise reduce environmental impact.

The combined economic power of San Mateo County communities is substantial. Helping clean technology companies establish a firm market for their products may accelerate their impact regionally, nationally and globally.

## ACTIONS

### *Easy/ Short-term*

- Sponsor events to educate the broader community about the importance of clean energy and resource-saving technologies. Invite venture capitalists and clean technology entrepreneurs to speak at local forums.

- **When in the market for alternative energy or energy-saving products, buy from local companies whenever possible**. Join the Joint Venture Silicon Valley Climate Protection Task Force to take advantage of technical evaluations and group discounts.

### *Intermediate/ Medium-term*

- Consider partnering with local clean technology businesses in innovative ways: help specify or provide feedback on government-sector product requirements or participate in a pilot program. **Help local governments become early adopters and leaders** in the use of clean technology.

# SHARED LEADERSHIP

## GOAL

To achieve the goals of the Energy Strategy, San Mateo County will encourage environmental leadership in all government departments, the business community and residents.

STRATEGY

*Invest in environmental expertise in local government.*

## 1. Make resource conservation part of everyone's job.

In recent years, public demand for action on energy and climate matters has increased dramatically as green values and actions become increasingly important to voters and business owners. **All government staff and elected officials need to become more knowledgeable about how energy, water and climate issues relate to and affect the county's economy and quality of life.** Staff in every department can save energy and conserve water through their individual actions. Almost all can increase their impact exponentially by applying their functional expertise in an environmentally conscious manner.

For example, facilities management can save enormous amounts of energy through audits, **retrocommissioning** and retrofit projects that upgrade lighting, HVAC systems, window coverings and mechanical systems. The information technology department can cut energy use by buying only energy-efficient equipment and using the Energy Star power-saving settings. Public Works can use more flyash in its concrete to improve strength and keep the material out of landfills. Parks and Recreation can consider switching to artificial turf and using high-efficiency irrigation systems. Personnel staff can find ways to encourage employees to take public transit and incent other environmentally-wise behaviors. Accounts payable clerks can red-flag unexpectedly high energy or water bills to help ensure that any problems are caught and fixed promptly.

The first step to encouraging such proactive behavior is awareness. The more a person understands about the impact of their actions, the more able s/he is to modify them to alter the impact. Awareness can be increased through formal training classes, recommended reading, presentations at staff meetings and City Council meetings and informal conversations between colleagues.

The second step to encouraging new behaviors is encouragement. If staff members are urged to look for ways to reduce energy and save water, many will do so and find opportunities that would otherwise go unrecognized. If employees feel empowered to make suggestions about how their community can reduce its environmental impact, they are more likely to do so.

The third step is to reward individuals who take the initiative to suggest new ideas and find ways to make energy efficiency and water conservation part of their job. Leadership is fostered by praise from a manager, recognition at a staff meeting, a letter from the mayor and other acknowledgments of a job well done. Financial rewards are always appreciated but not always necessary for individuals to feel that their efforts were appreciated.

## 2. If possible, fund an environmental position.

Only a handful of jurisdictions in San Mateo County currently have full-time employees assigned to environmental issues. Most have a broad portfolio, covering such areas as waste management and recycling, green building, energy efficiency, water conservation and climate protection. Some smaller and mid-sized cities are relying on volunteers to help understand and address these issues, either formally, as in Woodside, or indirectly, as with San Carlos Green, a citizen-sponsored task force.

With so many programs offered for local governments, a community is more likely to get the maximum benefits available if a staff member, consultant or intern can look for ones that match local priorities. In larger communities, a staff position may be funded by savings, cost avoidances and/or grants. Some of the tasks and benefits of a dedicated staff person include:

- Lowering utility bills (by proactively looking for ways to save water and energy);

- Avoiding f high electricity rates (by managing peak power demands);
- Catching and correcting any utility billing errors;
- Taking advantage of existing state programs, financial incentives and other offers;
- Ensuring water supplies will meet current needs and anticipated growth;
- Minimizing solid waste landfill, reducing waste generation and maximizing recycling in accordance with AB939, the Integrated Waste Management Act;
- Limiting wastewater discharge and thus the need for additional wastewater treatment facilities (and also benefiting the Bay).
- Reducing greenhouse gas emissions in accordance with AB32 (the Global Warming Solutions Act) and supporting regulations.

For the same reasons that a city can benefit from having in-house environmental expertise, the county as a whole can be rewarded by such an investment. The Energy Strategy recommends that at the Countywide level funds be allocated to provide staff to address the mounting number and importance of environmental issues, and take full advantage of resources offered by the state, regional agencies and other entities.

## ACTIONS

### *Easy/ Short-term*

- Take advantage of free or low-cost **training** opportunities offered by Energy Watch, the Pacific Energy Center, Sustainable Silicon Valley, RecycleWorks, Build It Green and other organizations. (Education)
- **Identify a point person for environmental issues on City Council and on staff** (even if the staff person has another job). If at all possible, **assign budget and full-time staff** to manage environmental programs. Duties should include:
  - Complying with stormwater pollution prevention regulations.
  - Complying with AB 939 regulations and reporting requirements. (Not an energy strategy)
    - Managing garbage and recycling services.
    - Promoting waste reduction and recycling to residents and businesses.
  - Staffing environmental task forces and commissions.
  - Educating public and staff about energy efficiency, green building and water conservation.
  - Promoting transportation alternatives.
- If it's not possible to assign full-time staff, try the following:
  - Recruit college or graduate school interns with environmental expertise; many are eager to work with cities and acquire valuable work experience.
  - Share a single resource (part-time, FTE or intern) among several cities with a similar energy profile.

*Intermediate/ Medium-term*

- **Establish an Energy Task Force** to identify, analyze, plan, prioritize and implement energy-saving measures in civic facilities and the broader community.

    - Try to include representatives from facilities or public works, finance, the City Manager's office and the City Council to ensure that energy efficiency plans are cost-effective, adequately resourced, and supported by the affected departments and individuals.

    - If no staff resources are available, start a Citizen Task Force to do research and help with planning and prioritization. Burlingame, Menlo Park, San Mateo and other local cities have Green Ribbon Task Forces at work.

    - In the alternative, create a multi-jurisdictional Energy Task Force with representatives from different cities with a similar energy profile. Facilities, financial issues and energy-saving opportunities may be similar enough to make a joint approach politically feasible and cost-effective.

## STRATEGY

### *Recruit and support community leaders at every level.*

Change doesn't happen without strong, visible, committed leaders who can articulate a vision and guide others toward the desired state. Leadership in resource conservation must come from elected officials and city staff, but is also needed throughout the community and at all levels. **Local governments can increase the level of civic involvement, take advantage of free help and make their own job easier by recruiting and empowering others to help meet the goals of the Energy Strategy.**

Burlingame, Menlo Park, San Mateo, San Carlos and other cities are creating Green Ribbon Task Forces to help shape policy and prioritize measures to mitigate climate change. Members of the community have proven eager to donate their time and expertise to gather data and sort through complex issues. But even communities that aren't yet ready to tackle climate change can take advantage of the growing public interest in environmental issues by recruiting city employees and volunteers to organize a program, teach a class, coach a neighborhood group or help a small business make its operation more green.

### 1. Partner with local businesses and nonprofits.

The commercial sector represents half or more of the energy used in almost every city in San Mateo County, and in a few cases, dwarfs residential use. **Meeting the countywide energy and water use reduction goals will require the active engagement of the business community.** Fortunately, many businesses within the county—including many of the largest—have already taken substantial steps to lower their energy use and reduce the environmental impact of their operations. These leaders are often generous in sharing their experiences with other businesses.

For those businesses that have not yet done so, market and regulatory forces are raising awareness about the economic benefits of becoming more resource-efficient. Some factors include:

- Energy prices continue to rise, cutting into operating budgets and margins.
- Energy-efficiency programs that are available at little or no cost can dramatically reduce utility bills.
- Restrictions on water use and water rate increases are expected.

- Customers want to do business with green companies.
- Being energy- and water-efficient generates good PR and goodwill with stockholders.
- Large companies will be tracking developments of AB32 (the Global Warming Solutions Act) and related regulation over the next several years.

*Commercial real estate uses 14.5% of the electricity and 6% of natural gas in the county.*

PG&E offers an extensive array of programs and financial incentives for large and small businesses alike. **Programs that save both water and energy for businesses will bring substantial benefits to participants and the broader community alike.** Depending on the size and type of businesses within a community, local governments may wish to partner with a local trade association, chamber of commerce or nonprofit organization to ensure awareness of existing energy-efficiency programs and encourage their use.

The County has implemented a **Green Business Certification** program to help local businesses reduce their environmental impact. The program emphasizes energy efficiency, water conservation, pollution prevention and waste reduction.

Rented and leased office space consumes more energy than any other industry segment in the county[3]— 14.5 percent of total electricity and six percent of natural gas (2005 data). The average office building can readily reduce energy use by 30 percent simply by improving building operation standards, representing enormous savings potential.

The county's many restaurants, cafes and drinking establishments also consume a significant amount of natural gas (9.7 percent of the total) because they use hot water for dishwashing and cleaning. Targeting these establishments for efficiency upgrades can help cities reduce energy use and save water at the same time.

Nonprofits like Sustainable Silicon Valley (SSV) can play an important role in facilitating business-to-business sharing of best practices and networking opportunities. Members of SSV and Silicon Valley Leadership Group (SVLG) can take advantage of Energy Watch retrocommissioning and other services. Green-oriented business associations exist to support and encourage members. Small businesses may be more easily reached through the local Chamber of Commerce or a local merchants' association. See the Industry-Specific section in Appendix D for more information.

### 2. Encourage individuals to embrace energy-efficient habits.

Information is now readily available on ways to save energy and conserve water, but studies show that information is not enough to create widespread, long-lasting behavioral change. [4] **Civic leaders can encourage and support energy-efficient behavior at little or no cost** by:

- Explaining the financial, environmental and social benefits of purchasing less power and less water in city newsletters, mailings and meetings, and on the website and signage in public facilities.

[3] The energy use figures are categorized by industry codes. The Real Estate category (no. 531) includes renting, leasing or managing real estate for others, as well as buying, selling or appraising real estate. North American Industry Classification Systems (NAICS), http://www.census.gov/epcd/naics02/naicod02.htm.

[4] *Fostering Sustainable Behavior: An Introduction to Community-Based Social Marketing*, by Doug McKenzie-Mohr and William Smith (New Society Publishers, 1999), 8-11.

- Modeling good behavior by installing highly efficient lights, equipment and plumbing fixtures and using only drought-tolerant plants when landscaping.

- Recognizing and rewarding individuals that have made meaningful efforts to reduce their energy and water consumption.

- Removing barriers to energy-efficient behaviors, such as publicizing drop-off locations for discarded compact fluorescent bulbs.

Several environmental organizations have compiled lists of "10 things you can do" to save energy or combat global warming. A community may wish to endorse one of the lists and ask residents to pledge to take action on one or all items.

Neighborhood-based groups are another way for a community to take action. Small teams of 8-10 people support each other in their efforts to reduce their ecological impact in the areas of energy, water, waste, chemicals and transportation. Acterra is a Palo Alto-based nonprofit that can help to organize such Green Teams and track their progress. Another option is for cities to promote and sell copies of a workbook that addresses the same issues, called *The Low-Carbon Diet*.

## ACTIONS

### *Easy/ Short-term*

- Partner with businesses, nonprofits, schools and other groups to influence resource-efficient behavior in all parts of the community.

- **Collaborate with other cities** in the area with similar types of commercial activity, such as movie theaters, auto repair shops, big box retailers and golf courses.

- Leverage the energy efficiency programs and trainings offered by **BOMA International**, a trade association for building owners and managers. The San Francisco chapter is happy to partner with local governments to encourage energy efficiency in their members' buildings.

- Encourage local retailers to carry a large selection of compact fluorescent and LED lights and start limiting their supply of incandescent bulbs.

- **Target high-water use businesses** such as restaurants, laundry facilities, hotels and hospitals and for programs that can save both water and energy.

- Work with SAMCEDA, the local **Chamber of Commerce** and merchant associations.

- Leverage and support state and regional **public outreach and education** programs.

    - Reinforce the messages of Flex Your Power and other energy- and water-saving campaigns in formal and informal communications, city policies and actions.

    - Promote local workshops and training offered at the Pacific Energy Center, RecycleWorks, SSV, etc. (Education)

- Encourage neighborhoods to start Green Teams, and post their combined energy savings on the city website.

- Send letters of commendation to school teachers and students who demonstrate energy-awareness and the need for water conservation in science classes, science fair projects or other schoolroom activities.

- Post energy efficiency information and materials available on the city website, in city facilities, libraries and local stores, and encourage a friendly competition between neighborhoods for the most innovative and effective energy- and water-saving ideas.

- Create an online suggestion box for ideas about how to conserve resources. Publicly recognize the people whose ideas are implemented.

- Recruit and train **Energy Ambassadors** from among city staff, residents and local businesses and ask them to share energy-saving information with their peers.

- Recruit and train **Water Ambassadors** to do the same for water conservation.

- Support existing neighborhood-based programs and publicize the Green Team program. (Education > NEIGHBORHOOD GROUPS)

# SECTION 7. NEXT STEPS

A countywide strategy needs countywide buy-in and participation. Once the Energy Strategy is approved by the San Mateo County Board of Supervisors (which funded its development) and the C/CAG Board (under whose authority it was produced), it will be circulated to the cities and the County for comment. All jurisdictions in San Mateo County will be asked to adopt the Energy Strategy and the five countywide goals. Jurisdictions will also be asked to release power purchase information from PG&E for their community, on an ongoing basis, to allow C/CAG to track progress.

A countywide implementation plan and ongoing resources will be needed to ensure that the goals and related economic and environmental benefits are achieved. The Energy Strategy recommends that at least one countywide staff position be added to coordinate the development of the implementation plan and collaborative efforts across jurisdictions.

The following milestones are suggested as the first step in an implementation plan.

## ENERGY

**Milestone 1:**

*Establish the baseline power purchase level (2005 electricity and natural gas purchases from PG&E) for each community and for the county as a whole.*

To meet the countywide energy reduction goal, an accurate baseline level of countywide energy is needed. Each community will need to establish its individual baseline to track its own efforts, and the sum of the 21 jurisdictional baselines will serve as the overall countywide baseline.

Every jurisdiction should take part in the ICLEI, Government Operations Inventory, which is being sponsored by JVSVN, for a more accurate report leading to specific actions directed at government operations.

Timeline: To be completed by December, 2008.

**Milestone 2***:*

*Identify targets and programs that will ensure the countywide energy goal is met.*

There are many ways to meet the countywide goal. The Energy Strategy recognizes the need to balance each community's autonomy with the imperative for action to preserve the county's prosperity and quality of life. The goal is intended to encourage communities to work collaboratively across city boundaries and sectors to achieve meaningful reductions in energy use and to significantly increase the production and use of local, clean energy.

One city might set strong energy efficiency goals for its internal operations and community. Another might choose to encourage or require residents to install solar panels or fuel cells to reduce demand on the electric grid by a certain percentage. Countywide programs targeting particular populations like the small business community, big box retailers or owners of large homes may also be needed to ensure that the overall goal is achieved.

Timeline: To be completed by December, 2009.

**Milestone 3:**

*Develop plans to meet the energy reduction goal.*

Specific plans will be needed to ensure that the county as a whole and individual communities are able to meet the targets they have set for themselves.

Timeline: To be completed by December, 2009.

Note: Detailed suggestions on how to develop an energy reduction plan are included in the Energy Strategy Report. Communities can also get help from nonprofit organizations and other Bay Area communities.

**Milestone 4:**

*Track the development of energy reduction plans and progress toward the goal.*

The status of energy plans and ongoing power purchases must be tracked to see if the plans are working as expected. If not, the strategies and/or level of resources may need to be adjusted.

Timeline: Assess status every year, beginning in 2009.

Note: The USTF or another entity will be convened to verify the status of efforts throughout the county. The analysis will identify resource gaps, best practices and further opportunities to share knowledge and resources.

## WATER

**Milestone 1:**

*Establish the 2005 water use level for each community and for the county as a whole*

As with energy, it is necessary to establish a baseline water use level for each jurisdiction and the county as a whole so progress can be tracked.

Timeline: To be completed by March, 2008.

Note: This milestone has been completed pending review by BAWSCA.

**Milestone 2:**

*Identify targets and programs that will ensure the countywide water goal is met.*

As with the energy goal, one jurisdiction may set strict water efficiency goals for its operations and community. Another may focus on increasing its use of "self-generated" water—rainwater, greywater and recycled water.

Timeline: To be completed December, 2008.

**Milestone 3:**

*Develop plans to meet the water conservation goal.*

Specific plans will be needed to ensure that the county as a whole and individual communities are able to meet the targets they have set for themselves.

Timeline: To be completed December, 2009.

Note: Elements of a water conservation plan are included in the Energy Strategy Report. BAWSCA and local environmental nonprofits can also provide assistance in developing a plan.

**Milestone 3:**

*Track the development of energy reduction plans and progress toward the goal.*

The status of energy plans and ongoing power purchases must be tracked to see if the plans are working as expected. If not, the strategies and/or level of resources may need to be adjusted.

Timeline: Assess status every year, beginning in 2009.

Note: The USTF or another entity will be convened to verify the status of efforts throughout the county. The analysis will identify resource gaps, best practices and further opportunities to share knowledge and resources.

## COLLABORATION

**Milestone 1:**

*Establish an effective, interactive relationship with PG&E for long-term planning and communications.*

Timeline: Develop a process by August 2007 and implement it by December 2007.

Note: This milestone has been partly achieved. A new collaboration and communication process has been developed to keep local governments in San Mateo County informed about upcoming PG&E projects and engaged in the energy planning process.

**Milestone 2:**

*Effect a change in state policy to permit local governments to use their clean energy production credits for any of their accounts.*

Restrictions on **net-metering** currently prohibit most jurisdictions from using energy credits earned at one government facility (e.g. from a solar electric system on a fire station) to be applied to other facilities (e.g. city hall). A change in this law would provide local governments with more options for generating their own power cost-effectively.

Timeline: Propose and promote a bill or pursue an alternative strategy to achieve the same ends by December, 2009.

Note: A subcommittee of the USTF is working with PG&E and state legislators to craft a solution acceptable to all parties.

**Milestone 3:**

*Establish an effective process for coordinating the development of the implementation plan and collaboration among the communities.*

Funding is being established to provide for one full time staff person to coordinate these efforts. This position will organize a bi-monthly meeting for information sharing, and a quarterly workshop event on topics timely to progress towards the goals in the Energy Strategy.

Timeline: To be completed by the June, 2008 budget cycle.

**Milestone 4:**

*Establish a Countywide forum to facilitate sharing of information and monitoring of countywide results.*

Timeline: As part of the adoption of the Energy Strategy and Collaboration milestone 3 above.

## ECONOMIC OPPORTUNITIES

**Milestone 1:**

*Identify an appropriate group to spearhead the county's efforts to attract and retain clean technology companies.*

Promoting economic development is outside the scope of the Energy Strategy, but it is an important element of a successful strategy.

Timeline: To be completed by December, 2008.

Note: SAMCEDA is an obvious candidate for this role.

## SHARED LEADERSHIP

**Milestone 1:**

*Identify one or more elected officials and staff members to take the lead on energy, water and climate issues in each jurisdiction.*

Environmental issues, especially climate protection, will only become more important in the coming years. Designating at least a few leaders in every community will make it easier to gain traction, exchange information and make meaningful progress toward goals.

Timeline: To be completed by June, 2008.

Note: Most of the jurisdictions in the county have identified a staff member to participate in the Joint Venture Silicon Valley Climate Protection Task Force, and many also have elected officials who are actively involved with climate and sustainability issues. Sharing the names of the right contacts will make it easier for communities to collaborate.

# APPENDICES

# APPENDIX A

## Status of City & County Efforts

| *Jurisdiction* | *Elected contact* | *Staff contact* | *Res. of support for ES* | *JVSVN Task Force* | *ICLEI* | *Mayor's Agree-ment* | *SSV* | *Solar fees (in $)* |
|---|---|---|---|---|---|---|---|---|
| **Atherton** | | | | Y | Y | Y | N | 250 |
| **Belmont** | Bill Dickenson | | | Y | | N | N | 0 |
| **Brisbane** | Sepi Richardson | | | Y | | N | N | 250 |
| **Burlingame** | Terry Nagel | Gordon Gottsche | | Y | | Y | N | 309 |
| **Colma** | | | | N | | N | N | 80 |
| **Daly City** | | | | Y | | N | N | 490 |
| **East Palo Alto** | | | | Y | | N | N | 541 |
| **Foster City** | | Kristi Chapelle | Y | Y | | N | N | 0 |
| **Half Moon Bay** | | | | N | | N | N | 291 |
| **Hillsborough** | | | | Y | | N | N | 509 |
| **Menlo Park** | | Dianne Dryer | | Y | Y | N | N | 411 |
| **Millbrae** | | Shelley Reider | | Y | (Y) | N | N | 358 |
| **Pacifica** | | | | Y | | N | N | 334 |
| **Portola Valley** | | | | N | Y | Y | Y | 50 |
| **Redwood City** | Barbara Pierce | Magda Gonzalez | | Y | | Y | N | 261 |
| **San Bruno** | | | | N | | Y | N | 320 |
| **San Carlos** | | | | Y | | N | | 0 |
| **San Mateo** | | | | Y | | Y | Y | 225 |
| **South San Francisco** | | | | Y | | Y | N | 300 |
| **Woodside** | Deborah Gordon | | | Y | | N | N | 30 |
| **County of San Mateo** | Jerry Hill | Kim Springer | | Y | | N | Y | 345 |

# APPENDIX B

# Glossary

**Adaptation** Steps taken as a result of, or in anticipation of, changes to the natural and built environment caused by climate change.
**Bay-friendly** A term used to denote landscaping practices that are appropriate for the Bay Area climate (i.e. can handle wet winters and dry summers), limit or eliminate the use of pesticides and herbicides and reduce surface runoff.
**Biodiesel** Diesel fuel made from vegetable matter, sometime waste vegetable oil.
**Biogas** Fuel produced by the fermentation of organic matter such as municipal waste, manure or sewage sludge. Biogas is usually composed of methane and carbon dioxide.
**Biomass** Plant-based matter burned for fuel, generally in an industrial setting.
**Carbon footprint** The amount of carbon dioxide generated whenever human activities involve the burning of fossil fuels. The term is usually used in reference to an individual or entity.
**Carbon offsets** Investments in actions intended to reduce carbon emissions (or more generally, greenhouse gas emissions), made with the intention of slowing climate change.
**Cap and trade** A market-based mechanism used to modify behavior to achieve environmental benefits. Under the system, entities are granted a certain number of credits, e.g. to emit some number of tons of a harmful chemical like nitrogen oxide or sulphur dioxide. Entities that use fewer than the permitted credits may sell their excess credits to entities that exceed their allotted number. A cap and trade system worked well to reduce acid rain in the Northeast in the 1980s. Europe has implemented a cap and trade system for greenhouse gas emissions that has been criticized for setting the number of credits too high.
**Clean fossil fuel** Generally a reference to natural gas, which burns cleaner than coal, petroleum or other oil derivatives.
**Climate change** The impact of increased temperatures on the short-term and long-term climate patterns around the world.
**Climate protection** Measures taken by governments, businesses and individuals to lower greenhouse gas emissions and thereby limit the growth of global warming.
**Co-generation** A traditional power source that captures and uses the waste heat generated by the process of producing electricity. Co-gen systems are sometimes called "combined heat and power "(CHP) systems.
**Commissioning** Verifying that systems were properly installed and configured and are operating efficiently in a newly-constructed building. Retrocommissioning is the same process for an existing building.
**Community Choice Aggregation (CCA)** Cities that purchase power and sell it to their residents and business community in lieu of having those customers buy power from the local utility.
**Compact Fluorescent Lamp (CFL)** A lamp that uses approximately one-quarter of the electricity used by a comparable incandescent bulb. CFLs use more energy than LEDs. CFLs contain mercury and must be disposed of as a hazardous material.
**Conservation** The practice of using less of a particular resource, such as energy or water. Also used to describe efforts used to preserve or protect the natural environment.
**Daylighting** A green building design technique that relies on natural light as much as possible, thus saving energy used for task and general lighting.
**Demand response** Actions or programs intended to reduce energy consumption during specific periods, usually peak periods on summer afternoons.
**Distributed generation** Decentralized sources of power production, such as solar electric systems and wind turbines. Distributed generation is contrasted with centralized generation, where power is produced by utilities at power plants.
**Ecological footprint** A measure of how much land and water area a human population requires to produce the resources it consumes and to absorb its wastes under prevailing technologies.
**Energy audit** An assessment of the current and potential energy efficiency of a building or process.

**Energy efficiency** The practice of using less or the least amount of energy needed to achieve a task.
**Energy Service Company (ESCO)** Companies that provide energy audits and related services to organizations. The energy savings that result from actions taken after an audit, or by installing a renewable energy system, are usually shared between the ESCO and the client under a long-term contract.
**Fuel cell** An alternative, renewable energy system that uses compressed hydrogen, a catalytic agent (usually platinum) and oxygen to produce electricity, heat and water.
**General Plan** The official planning document for a city. State law requires that it include seven elements (land use, circulation, housing, conservation, open space, noise and safety), but may have more. It is updated roughly once a decade.
**Geothermal** An alternative, renewable energy system that uses the constant temperature of the earth (approximately 200 feet below the surface) to warm or cool a building. Geothermal systems are more common in colder climates than exist in the Bay Area.
**Global warming** The current and future increase in the temperature of the earth's air and oceans.
**Green energy/ green power** A general term that refers to renewable forms of power generation such as solar electric, hydropower, wind energy, bio-based fuels, etc.
**Greenwashing** When companies engage in minimal efforts toward social or environmental responsibility in order to enhance their public image.
**Greywater** Water that is captured after its initial use, such as from a shower or sink, and diverted from the sewer line so it can be used again for irrigation or another purpose.
**Hydrogen** A chemical element that can be used to create energy. Some people believe that hydrogen can replace gasoline as a primary transportation fuel, although significant obstacles exist, e.g. in its natural state, hydrogen is a bulky gas. Hydrogen is the primary fuel in fuel cell systems.
**Hydroelectric** Electricity produced by hydropower.
**Hydropower** Electricity generated by extracting the energy released by water rushing over a stationary surface, such as a dam.
**Light-Emitting Diode (LED)** The most energy-efficient type of lamp commercially available at this time. LEDs are more efficient than CFLs.
**LEED** (Leadership in Energy and Environmental Design) A rating system developed by the U.S. Green Building Council to measure the degree of environmentally-friendly materials and techniques used in a building's design or operations. See Appendix under Organizations for more info.
**Mitigation** Steps taken to minimize or avoid foreseeable negative effects, e.g. of climate change.
**Net-metering** The ability to "sell" excess, locally-generated energy to the utility for a credit to be used at a later time.
**Peak demand** The period when user requirements for energy supply exceed the average demand. In Northern California, peak demand is during summer afternoons.
**Photovoltaic (PV)** The most common type of solar receptor used in solar electric systems today. A photovoltaic cell is made of crystalline glass, usually blue. Several PV cells are contained on a panel. Several panels are assembled into an array, or a system.
**Radiant heating and cooling** A type of space conditioning system using water to conduct and transport heat throughout a building. The same process can be used to absorb heat and cool a building.
**Renewable energy** Energy derived from natural, renewable resources such as the sun, wind, algae or biomass.
**Renewable Energy Credit (REC)** Energy users that wish to use green power but can't get it from their local utility sometimes choose to buy RECs (also known as "green tags") to help subsidize the market for clean, renewable energy. Producers of renewable energy own the credits and can sell them to a willing buyer. Prices vary, but average around 2 cents per kilowatt hour.
**Retrocommissioning** Commissioning an existing building to verify whether its systems are working as designed and to identify opportunities for performance improvements.
**Self-generation** Energy produced at the user's site through the use of solar electric, fuel cell, co-generation or other renewable energy systems.
**Smart controls** In buildings, smart controls can adjust the temperature, lighting and other systems based on occupant behavior and other variables with the goal of minimizing energy use. In landscaping and irrigation, smart controls can adjust frequency and amount of water delivered to plants based on rainfall and temperature variables.

**Smart growth** An urban planning and design approach that favors density and use of public transit and opposes suburban sprawl and dependence on cars.

**Solar**

**- Passive heating/cooling** Passive solar design relies on a building's orientation toward the sun and mass to regulate internal temperatures and occupant comfort.

**- Electric** An alternative, renewable energy system that consists of a solar receptor (often photovoltaics, see above) and an inverter. The inverter converts the direct current (DC) flow of electricity generated from the sun into the alternating current (AC) used in residential and commercial settings. Many systems also have a connection to the utility grid and a meter.

**- Hot water (solar thermal)** An alternative, renewable energy system that uses the sun's rays to heat water for domestic or commercial use. Solar hot water systems in harsher climates use a liquid other than water to absorb solar energy and heat the water.

**Time-of-use** A utility rate that charges more for energy used when demand is highest (during peak periods, summer afternoons) and less for off-peak hours.

**Water conservation** Actions or practices intended to use less or the least necessary amount of water to perform the task.

**Wind power** An alternative, renewable form of energy production using stationary turbines to harness the energy in wind. The biggest challenge with wind power is its intermittent nature.

# APPENDIX C

# Task Force Reports

Energy Snapshot (6/5/2006)
Water-Energy Report (8/2006)
Big Users by Industry (8/2006)
Workplan and Actions (9/2006)
Progress Report and Recommendations (2/2007)